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A Psychometric Evaluation of Five Commonly Used Measures of Family Functioning and How They Correlate with Development of Children with Disabilities

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A PSYCHOMETRIC EVALUATION OF FIVE COMMONLY USED MEASURES OF FAMILY FUNCTIONING AND HOW THEY CORRELATE WITH DEVELOPMENT OF CHILDREN WITH DISABILITIES

by

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Matthew James Taylor

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by

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In response to the increased emphasis in early intervention on assessing family functioning, there has been substantial effort over the past 15 years to develop instruments that can measure important aspects of family functioning with families of children with disabilities. While the multitude of recently developed family measures has given researchers and clinicians a variety of instruments from which to choose, research on the quality of the data derived from these instruments has lagged behind. Considering the importance of family functioning in current early intervention programs and the potential impact on the type of intervention delivered, further investigation of the psychometric properties of widely used measures of family functioning seems essential.

The specific purpose of this research was to conduct a full psychometric assessment of five of the most widely used measures of family functioning for families with children with disabilities. The

conclusions that can be drawn from this research are as follows: Each of these measures was strengthened by new scoring strategies, showed high reliability, demonstrated strong construct and current validity, and, individually, did not relate strongly to child development. However, when taken as a whole, these measures were very useful for family assessment in early intervention research and early intervention service provision.

(212 pages)

CHAPTER I

INTRODUCTION

In 1986, Public Law 99-457 was passed and the stage was set for significant expansion of appropriate early intervention services for all young children with disabilities (Bailey, 1992). This law also emphasized the importance of family-based support and intervention. Where the focus of intervention had previously been on the child, the focus of intervention now became the family unit. Although many researchers and practitioners have recognized the value of this philosophical shift to a family-centered approach (e.g., Adams, 1992; Bailey, 1992; Dunst, 1985), they have cautioned that moving to a family-centered approach will require assessing the resources and needs of all family members, and not just those of the child. Unfortunately, we know little about the impact of effective early intervention programs on families using available assessment instruments, nor the relationship of these family assessment constructs to other outcomes (Bailey & Simeonsson, 1988).

Most previous early intervention research has been primarily child focused and, consequently, information about the families of children involved in efficacy studies and the effects of early intervention on the family have been ignored (Casto & Lewis, 1984). Most commonly the only family information collected has been demographic. Such data clearly lacked the ability to describe salient aspects of family functioning identified in the literature as important for evaluating early intervention research, such as parental stress, family cohesiveness, and available support and resources

(Casto & Mastropieri, 1986). As such, much of the information about family functioning which is potentially pertinent to intervention and outcome evaluation has not been assessed (Dunst, Snyder, & Mankinen, 1989). This lack of information about the family and the effects of intervention on families has resulted, in part, because there have been very few well tested, psychometrically sound measures of family functioning available for use (Bailey & Simeonsson, 1988).

In response to the increased emphasis in early intervention on assessing family functioning, there has been substantial effort over the past 15 years to develop instruments that can measure important aspects of family functioning with families of children with disabilities. A number of these instruments are now widely used in conjunction with early intervention programs. As discussed more fully in the review of literature, the instruments include those that measure global family functioning, as well as those which focus on specific aspects of familial and parental functioning such as stress, cohesiveness, or perceptions of support and resources.

While the multitude of recently developed family measures has given researchers and clinicians a variety of instruments from which to choose, research on the quality of the data derived from these instruments has lagged behind. Virtually all of the family measures lack sufficient psychometric information concerning reliability and validity to support their current usage either to evaluate or structure early intervention programs, or to assess family needs (Bailey & Simeonsson, 1988). For instruments developed specifically for use with a population of families of children with disabilities,

the limited psychometric information available in the literature has been based on extremely small, nonrepresentative samples. For instruments that have undergone more rigorous psychometric analysis, information is based on data collected primarily from samples of families with children who do not have disabilities. Thus, the interpretation of data from these instruments when they are used with families of children with disabilities is questionable.

The assessment of families participating in early intervention programs can be useful in a variety of ways. Description of program participants and needs assessment of programs are potential uses in evaluation of early intervention programs. Of course, data from these instruments can be more useful if their relationship to child outcomes can be established. First, if a strong relationship exists between an aspect of family functioning and the development of the child, then strategies for intervention may be derived from this information. For example, if parent stress specific to attachment is significantly related to the child's social skills, then an intervention program aimed at promoting parent-child attachment might yield gains in child social skills. Also, family measures that relate to child outcomes can help to refine experimental group comparisons because the family data may be used as mediating variables. That is, if a family outcome can be identified as a mediating variable, then statistical power can be gained, or group differences on that variable can be accounted for, thus providing a more refined comparison on the child outcome (Taylor & Innocenti, 1993).

Considering the importance of family functioning in current early intervention programs and the potential impact on the type of intervention delivered, further investigation of the psychometric properties of widely used measures of family functioning seems essential. The rationale for this need stems from two main sources. First, the Standards for Educational and Psychological Testing (American Psychological Association, 1985) require that the reliability and validity of measures be demonstrated for the specific purpose and with the population for which they are being used. Second, what is considered "abnormal" or problematic for a family without a child with a disability may be "normal" and adaptive for families with children having a disability (e.g., Fruge & Adams, 1992). For example, what might be termed "overprotectiveness" with a child without a disability, may be responsible parenting for a child with a disability.

This research, then, addresses the need which exists to shed further light on the psychometric properties of family assessment instruments. The specific purpose of this research was to conduct a full psychometric assessment of five of the most widely used measures of family functioning for families with children with disabilities: the Parenting Stress Index (PSI; Abidin, 1990), the Family Inventory of Life Events and Changes (FILE; McCubbin, Patterson, & Wilson, 1983), the Family Support Scale (FSS; Dunst, Jenkins, & Trivette, 1984), the Family Resource Scale (FRS; Dunst & Leet, 1985), and the Family Adaptability and Cohesion Evaluation Scales (FACES III; Olson, Portner, & Lavee, 1985) to determine their relationship to child

development as measured by the Battelle Developmental Inventory (BDI; Newborg, Stock, Wnek, Guidubaldi, & Svinicki, 1984). The following objectives regarding each of the five family measures were addressed:

1. Examine the subscales used with each instrument and determine whether these subscales are useful in describing constructs related to child outcomes and determine their usefulness for evaluating early intervention programs.

2. Determine the reliability and validity of the scores from these measures related to child outcomes for purposes of evaluating the effects of early intervention programs.

3. Determine the relationship between these measures of family functioning and child outcomes assessed by the Battelle Developmental Inventory.

CHAPTER II

REVIEW OF LITERATURE

The measurement of family functioning has taken on more importance with the increased emphasis on family involvement in early intervention. This type of measurement assesses many facets of family functioning as will be shown, and also serves a variety of purposes. The measures that have been developed recently are typically used (a) to describe participants in early intervention programs, (b) to determine the most appropriate way to deliver effective intervention to a child in light of the particular strengths and weaknesses of that child's family, (c) to determine what types of intervention activities are necessary to assist the family, (d) to evaluate the impact of an early intervention program on either children or families, (e) to monitor side effects of early intervention programs, or (f) to meet legal mandates (Bailey & Simeonsson, 1988). Thus, the importance of family assessment, even across a wide range of constructs, is clear. Although there are many potential uses for these measures, this study focused only on the measures' ability to evaluate the efficacy of a particular early intervention program, and within that purpose, to determine the relationship between these family outcomes and child development.

This literature review will begin with a brief description of various family functioning theories, or perspectives. Following that, a complete review of studies relevant to the psychometric validation of each measure will be presented. This includes the initial works used for test construction, as well as later structural analyses. In

addition, all studies which examined concurrent validity of these measures within special populations will be reviewed. The final measure, the Battelle Developmental Inventory (BDI), is reviewed, not from a validation perspective, but from a critical viewpoint of why the BDI was a reasonable choice to measure child development for this study.

Some previous work on the relationships between these measures has been conducted at the Early Intervention Research Institute (EIRI). Because this work is directly relevant to this research, and because it deals with more than one measure at a time, this work was reviewed together and at the end of the review of measures to both demonstrate its importance as a precursor to this research, and ultimately, to demonstrate the need for this research. Finally, a brief discussion of available psychometric tools is presented.

Conceptualizing Family Functioning

There is more than one way to conceptualize family functioning (Krauss & Jacobs, 1990). Current theories and models include, first, sociological models. This concept views family functioning by its empirically based enduring dimensions. These dimensions include relationship dimensions (e.g., cohesion and conflict), personal growth dimensions (e.g., achievement, culture, and religiosity), and system maintenance dimensions (e.g., family organization and environment).

The circumplex model (Olson, 1991) is an example of the sociological perspective and includes two dimensions: family adaptability and family cohesion. Initially, these components were

thought to be curvilinear; that is, too much adaptability and/or too much cohesion were related to family disfunction (Burr & Lowe, 1987). Too much adaptability moved the family from flexible to chaotic and too much cohesion moved the family past connected to enmeshed. Later research (Olson, 1991) indicated, however, that each of these dimensions wase linear, and that more adaptability and more cohesion (as was measurable) were desirable.

Another way to conceptualize family functioning is using family systems theory. This view of family functioning has greater clinical use because it focuses on the individuals within the family rather than the family context. Krauss and Jacobs (1990) summarized the seven principals of family systems theory as: circular causality (i.e., each family member causes changes in each other), nonsummativity (i.e., the whole is greater than the sum of its parts), equifinity (i.e, stimulus-response systems are different for each member of the family), communication (i.e., all behavior communicates both factual and relationship information), family rules (i.e., a system of organization), homeostasis (i.e., the existence of a steady state), and morphogenesis (i.e., flexibility to adapt to internal and external change). This theory includes the premise that individual dysfunction is a symptom of family dysfunction. Unfortunately, the use of assessment grounded in this theory for special populations has not been studied.

The Double ABCX Model (McCubbin & Patterson, 1982), which identifies stressors and means for coping with stress, is representative of the family stress theory of family functioning.

This model focuses on how families adapt to crises. That response, as the model proposes, is explained by the nature of the crisis, the available resources to handle the crisis, and the meaning given to the event. Thus, family assessment couched within this model focuses on stress and events related to stress for the family.

Finally, the family life cycle theory views the family in a naturally occurring series of stages, the most important aspects of which are the strategies for facilitating transition from one stage to another. This theory seems to combine the other theories mentioned above, but goes on to suggest that families, like individuals, experience event-based cycles which include things like marriage, child birth, child rearing, child departure, and retirement (Krauss & Jacobs, 1990).

In each case, assessment of family functioning is guided by the theory driving the research. The four perspectives presented above do not likely describe all of the family system theories used to create measures of family functioning. Although it is not in the scope of this study to untangle these models and theories, these were briefly presented to set the context for the measures being analyzed here. All of the measures being analyzed in this study represent a cross section of these family functioning perspectives, and are representative of the most widely used measures for evaluating the efficacy of early intervention.

Recent reviews (Dunst, Trivette, & Deal, 1988; Fewell, 1986; Mott & Casto, 1986; Neisworth & Bagnato, 1990; Ostfeld & Gibbs, 1990; Paget, 1991) of family assessment generally attempt to promote the use

of family assessment for a variety of purposes. These purposes include: description, needs assessment, goals for intervention, and program efficacy. In each case, suggestions about what measures are available are made; however, none of these reviews attempt to evaluate the measures in any substantial way. With the possible exception of Fewell (1986), they do not report the reliability and validity of these measures specific to the variety of purposes and target populations mentioned. Assuming the importance of family assessment, the value of these reviews lies in the measures they cataloged.

In Mott and Casto (1986), who reviewed 25 of the most widely used self-report measures of family functioning in early intervention research, the authors stated that these measures assess four general constructs: social support and resources, stress and coping, family psychosocial environment, and parental knowledge, attitudes, and expectations. Table 1 gives some information on the 25 self-report measures cited by Mott and Casto (1986).

From this table, it can be seen that the field has been thriving in the last 15 years; most of the measures have been written and rewritten during this time. In addition, formats and psychometric assessment strategies used in the measures are very similar. Unfortunately, only 7 of the 25 measures have conducted factor analyses to help establish scale interpretability. Of these, most were conducted haphazardly, that is, without synthesizing statistical results with common sense analyses. Also, many of these measures were reported without complete reliability, validity, or normative

Table 1

Available Psychometrics Information on 25 Self-Report Measures of Family Functioning

Test	Year	Authors	Items	Format	α	Test/Retest Reliability	Factor Analysis	Socal Support & Resources	Stress & Coping	Family Psychosocial Environment	Parental Knowledge, Attitudes, & Expectations
1. The Adult Norwicki-Strickland Internal-External Control Scale	1974	Norwicki & Duke	40	Dichotomy	.39 - .69	.83					X
2. Child Expectation Scale	1986	Dunst & Trivette	8	Likert	.89 - .94	.96	X				X
3. Child Improvement Locus of Control Scales	1984	DeVellis, Revicki, & Bristol	27	Likert	.58 - .83		X				X
4. Concepts of Development Questionnaire	1982	Sameroff & Feill	20	Likert	.82						X
5. Coping-Health Inventory for Parents	1983	McCubbin et al.	45	Four Point	.71 - .79		X		X		
6. Family Adaptability and Cohesion Evaluation Scales (FACES III)	1985	Olson, Portner, & Lavee	40	Likert	.68					X	X
7. Family Environment Scale	1974	Moos, Insel, & Humphrey	90/40	Dichotomy	.64 - .79	.68 - .86				X	
8. Family Inventory of Life Events and Changes	1983	McCubbin, Patterson, & Wilson	71	Dichotomy	.81	.80				X	
9. Family Resource Scale	1985	Dunst & Leet	30	Likert	.94		X	X			

(table continues)

	Test	Year	Authors	Items	Format	α	Test/Retest Reliability	Factor Analysis	Socal Support & Resources	Stress & Coping	Family Psychosocial Environment	Parental Knowledge, Attitudes, & Expectations
10.	Family Support Scale	1984	Dunst, Jenkins, & Trivette	18	Likert	.77	.91	X	X			
11.	Impact on Family Scale	1985	Stein & Jessop	33	Likert	.88		X		X		
12.	Inventory of Parent Experiences	1985	Greenberg & Crnic	54	Multiple Choice, Short Answer	.60 - .85			X			X
13.	Iowa Parent Behavior Inventory	1979	Crase, Clark, & Pease	36	Likert							X
14.	Knowledge of Behavior Principles as Applied to Children	1979	O'Dell, Tarler-Benlolo, & Flynn	50	Multiple	.94						X
16.	Parent Role Scale	1981	Gallagher, Cross, & Scharfman	20	Identify						X	
17.	Parental Attitudes Survey Scale	1963	Hereford	75	Likert							X
18.	Parental Attitudes Toward Mentally Retarded Children	1984	Love	30	Likert							X
19.	Parent Stress Index	1983	Abidin	101	Likert	.89 - .95	.83	X		X		
20.	Perceived Social Support	1983	Procidano & Heller	20	Dichotomy	.88 - .90			X			

(table continues)

	Test	Year	Authors	Items	Format	α	Test/Retest Reliability	Factor Analysis	Socal Support & Resources	Stress & Coping	Family Psychosocial Environment	Parental Knowledge, Attitudes, & Expectations
21.	Questionnaire on Resources and Stress	1974	Holroyd	285	Dichotomy				X	X		
22.	Short Form of the Questionnaire on Resources and Stress	1982	Holroyd	66	Dichotomy	.31 - .84			X	X		
23.	Questionnaire on Resources and Stress--Short Form	1983	Friedrich, Greenberg, & Crnic	52	Dichotomy	.95			X	X		
24.	Questionnaire on Resources and Stress--Short Form	1986	Salisbury	48	Dichotomy	.65 - .84			X	X		
25.	Sibling Inventory of Behavior	1979	Shaefer & Edgerton	28	Likert	.61 - .85						X

information. Finally, most of these measures were evaluated using small or inappropriate samples.

Extant Data on Psychometric Soundness of the Five Measures

The five measures selected for this study are among the most reliable and widely used of the existing measures. In addition, they assess all four of the general constructs mentioned above. Finally, a large and appropriate sample has been assessed using these measures. Thus, information from this analysis will provide the early intervention field with information about measures that are available, easy to administer, and assess the broad spectrum of family functioning necessary for the evaluation of early intervention research.

The most pertinent psychometric information available for each of the five family measures is briefly summarized in Table 2. As can be seen from Table 2, the available information for each of these measures is limited. This makes interpretation and decision making on the basis of data from these instruments nearly impossible. For four of the instruments, the PSI, the FRS, the FSS, and the FACES III, some additional psychometric information is available; however, in all cases, the sample size for these studies was small, ranging from 20 to 113 (e.g., Burrell, 1990; Cameron & Orr, 1989; Chavkin, 1986; Greenberg, 1983; Jenkins, 1982; Kazak & Marvin, 1984; McCubbin, 1989; Morrison & Zetlin, 1988).

Table 2

Summary of Psychometric Information for Family Measures

Scale	Population	Norms	Concurrent Validity	Reliability	Construct Validity
Parenting Stress Index (Abidin, 1990)	Normal	N = 2,633	Many studies cited	N = 534 (.55 - .95)	N = 534
Burrell, 1990)	Variety of Disabilities	----------	----------	N = 113 (.60 - ,85)	N = 113
Family Adaptability and Cohesion Evaluation Scales (Olson et al., 1985)	Normal	N = 2,453	----------	N = 2,412 (.62 - .77)	N = 1,206
Family Resource Scale (Dunst & Leet, 1987)	Variety of Disabilities	----------	----------	N = 52 (.94)	N = 52
(Burrell, 1990)	Variety of Disabilities	----------	----------	N = 53 (.91)	N = 53
Family Support Scale (Dunst et al., 1984)	Variety of Disabilities	N = 139	Questionnaire on Resources and Stress	N = 139 (.77)	N = 39
(Burrell, 1990)	Variety of Disabilities	----------	----------	N = 53 (.42 - .81)	N = 53
Family Inventory of Life Events and Changes (McCubbin et al., 1983)	Normal Couples	N = 980	----------	N = 2,740 (.43 - .82)	N = 1,300

The Parenting Stress Index

The Parenting Stress Index is the most often used of the five instruments and has the most data-based support for both normal and special populations. The PSI was normed using 2,633 subjects. Internal consistency reliability coefficients taken from a sample of 534 were very high for the child total, parent total, and overall total stress scores, .89, .93, and .95, respectively. The lower order subscales showed reliability coefficients that ranged from .55 to .80. Scale and subscale structure was determined using factor analysis. The results indicated that the PSI is best interpreted using the multivariate factor structure described in the instrumentation section of this proposal.

One additional study which examined the construct validity of the PSI was conducted by Burrell (1990). In this study, which used families with young children with disabilities, a principal components extraction with a varimax rotation was conducted. The number of factors was determined by examining the principal components scree plot. The conclusions were that the analysis, despite the small sample size, demonstrated support for scoring the PSI according to the manual. In addition, internal consistency reliability coefficients for the second-order scales ranged from .60 to .80, and first-order and total alphas ranged from .90 to .95.

Unfortunately, this study does little to support such a scoring procedure. The scree plot provided little evidence for determining the number of factors; thus, the author defaulted to the same number described in the PSI manual. In addition, the small sample size

(N = 113) made it difficult to conclude anything concrete. Less than one third of the items loaded on recognizable scales as defined by Abidin (1990). A larger sample size, and a more thorough examination of the data, may have provided a scoring alternative, or a corroboration of the original PSI scoring procedures for this population.

Concurrent validity research is vast and includes measures of both child and family functioning. The following review of this literature will only contain those studies using appropriate populations, both for convergent and discriminant validity, as well as normative data used to discriminate differing populations, thus showing the relationship with child outcomes.

To date, a variety of studies has used the PSI to discriminate families from special populations from either the norms provided by the author, or comparison groups contained within the study. Hauenstein, Marvin, Snyder, and Clarke (1987) examined 452 Bermudian families with children who were at risk for cognitive and language delays and who ranged in age from 18 to 30 months. Internal consistency reliability coefficients computed with this sample were very similar to those in the test author's normative sample. In addition, the higher order factor structure was also similar to that of the original norm group. Data, in the form of means and standard deviations, were provided; from this the test authors concluded that the PSI is accurate in predicting the inclusion of a family in at-risk populations. Although this is an adequate sample size to conduct this

type of research, the choice of using Bermudians confounds the at-risk information with cultural information.

Hauenstein, Scarr, and Abidin (1987) used the PSI with parents of 52 children with diabetes with an average age of 11 years. Normative data given in means and standard deviations showed that the parents of the children with diabetes suffered from higher levels of stress than did the comparison group of parents with children without disabilities.

Solis (1990) was also able to use the PSI to discriminate families with children with and without disabilities. In this study, there was no description of the non-normal subsample; data in the form of subscale and total means and standard deviations were given. From this it was concluded that parents with children with disabilities suffer from higher levels of stress in all child-related areas, all totals, and some of the parent scales.

Adamakos et al. (1986) showed that the PSI can discriminate samples of disadvantaged parents from normal populations. In their study, 38 economically disadvantaged parents of infants were assessed with the PSI. The disadvantaged parents suffered from higher levels of stress than did the parents of the normative sample reported by Abidin (1990).

Goldberg, Morris, Simmons, Fowler, and Levison (1990) gave the PSI to 41 parents with infants less than one year of age. All of these children suffered from either cystic fibrosis or heart disease. In both cases, parents showed higher levels of stress than a comparison sample for all total scores, child subscale scores, and

some of the parent subscale scores.

Breen and Barkley (1988) gave the PSI to 26 parents of children ages 6 to 11 years with attention deficit disorder (ADD). Again, normative data in the form of means and standard deviations showed that the parents of the children with ADD exhibited higher levels of stress.

In general, it was found that these special populations suffered from higher levels of stress on the child domain and total score of the PSI, and that the PSI was able to discriminate these subjects from their "normal" comparison groups. Children with diabetes, low income, heart disease, and hyperactivity are not considered a part of the population of interest. However, for families with young children with disabilities, the previous studies do provide support for the notion that the PSI can discriminate samples of this type. Because the population with children with disabilities also exhibits higher levels of parent stress, it is important to know whether additional conditions do the same.

Several studies do exist that use the PSI to discriminate samples of families with children with disabilities. The results of these studies are not consistent. Most of these studies, using samples of parents of children with a variety of disabilities, showed that they suffer higher levels of stress than their comparison groups; however, this was not always the case. Lafiosca and Loyd (1986) assessed the parents of 39 children, 5 to 10 years of age, that suffered from a variety of disabilities. Again, the normative data reported as means and standard deviations showed that these parents

showed higher levels of stress on the child, parent, and overall stress totals.

Zimmerman (1980) assessed the parents of 20 children with cerebral palsy. The children were an average of 5 years of age. Means and standard deviations were reported on all scales and showed again that these parents displayed higher levels of stress than did parents of children without disabilities. Kazak and Marvin (1984) assessed parents of 53 children with spina bifida. These children were an average of 7 to 8 years of age. No data are reported, but the authors concluded that the parents of the children with spina bifida exhibited higher levels of stress than did the parents in the comparison group. Chavkin (1986) also assessed parents of children with spina bifida. In his sample, 14 of the children had spina bifida and 15 additional children were autistic. The ages of these children ranged from 8 to 12 years. Means showed that the parents of the autistic children had higher stress levels than did parents of children with spina bifida, and that both groups exhibited higher parenting stress than did the comparison group.

Finally, two studies assessed the parents of children with developmental disabilities. Cameron and Orr (1989) assessed 84 families with children ranging in age from 5 to 21 years. McKinney and Peterson (1987) assessed parents of 67 children 7 to 41 months of age. In both cases, the parents showed higher levels of stress than the norms established by Abidin (1990). This pattern, however, was not seen in Kazak, Reber, and Snitzer (1988). They assessed 45 parents of children with phenylketonuria (PKU). This disorder is an

enzyme deficiency that leads to mental retardation. The children in this study were all less than 6 years of age. Data, reported here in the form of means, standard deviations, and ranges, indicated that the PSI was unable to discriminate between the parents of children with and without PKU.

The data from the studies cited indicate that stress levels may vary due to the type of disability. They also indicate that the PSI, in most cases, can show significant differences between parents of children with disabilities and parents of children without disabilities. This means that the reported norms for the PSI are probably not appropriate for families of children with disabilities. The information contained in the above studies sheds incomplete light, however, because the very small sample sizes, and the lack of complete validity and reliability information suggest that more information is needed.

Normative data were not the only focus of studies using the Parenting Stress Index. Some studies have attempted to show its concurrent validity with a variety other measures within the population of families with children with disabilities.

Only one study examined the relationship between parenting stress and child functioning for children with disabilities. In this study, Zakreski (1983) assessed 60 newborns who were medically at risk due to prematurity. The results showed a very high correlation between child functioning as measured by the Bayley Scales and the PSI. This is consistent with other studies looking at this relationship (Abidin, 1990); however, this group was fairly normal as

the average developmental quotients were close to 100. Correlations of -.30 to -.64 at 3 months and -.54 to -.74 at 6 months were calculated.

In several other studies, concurrent validity was examined with a variety of other family functioning measures and parent well-being measures. Castaldi (1988) examined the relationship between the PSI and the Marlowe Crowne Social Desirability Scale to determine if a set of items from the PSI could predict levels of maternal defensiveness. Mothers of 56 children ages 3 to 5 who were learning disabled or mentally retarded participated. Fifteen items from the PSI were identified, and this new scale of the PSI did correlate well enough (r = .23 to .44) with the Social Desirability Scale to discriminate between high and low maternal defensiveness.

In Zimmerman's (1980) study with 20 children with cerebral palsy, parents were also assessed using the Support System Checklist. A wide range of correlations existed between this measure of support and the various scales of the PSI. Most notably, the highest correlations were with informal sources of emotional support such as friends and neighbors (r = -.64). Hanson and Hanline (1990) assessed mothers of 35 children, ages 3 and 4, with either Down syndrome, hearing impairment, or neurological impairment. In addition to the PSI, the Inventory of Parent Experiences was administered. Correlations between the two measures produced correlation coefficients as high as .68.

Krauss, Hauser-Cram, Upshur, and Shonkoff (1989) assessed the mothers of 213 children with an average age of 30 months and a variety

of disabilities. Correlations with the Family Adaptability and Cohesion Evaluation Scales (FACES I) ranged from -.18 to -.46. The highest correlations were between the parent total scale of the PSI and both adaptability and cohesion for the fathers. Income was only slightly related to the PSI as correlations were from -.15 to -.17. Speltz, Armsden, and Clarren (in press) assessed mothers of 33 children from 12 to 36 months of age with craniofacial anomalies. The General Well-being Schedule (GWB), the Social Health Battery (SHB), and the Locke-Wallace Marital Adjustment Scale (MAS) were given along with the PSI. Correlations of .46 to .64 were found for all measures with the PSI parent scale. The PSI child scale correlated highest with the GWB (r = .48).

Overall, concurrent validity with the PSI shows that a variety of child and family constructs relate to parenting stress. Despite the range of data presented here, it is clear that the small sample sizes hamper the usefulness of this information. The present study will certainly add to and clarify much of the psychometric qualities of the PSI, thus making it a more useful instrument for early intervention with families with children with disabilities.

The Family Adaptability and Cohesion Evaluation Scales

The second most used measure of the five addressed in this study is the Family Adaptability and Cohesion Evaluation Scales. Unfortunately, much of the information regarding the FACES concerns earlier versions of the measure. Very little is known about the FACES III.

The FACES III was normed using 2,453 families with normal children. A factor analysis using just the perceived responses to the FACES III extracted the two subscales, adaptability and cohesion in a very simple structure (i.e., no double loadings). This clean structure was not replicated in a study using 512 Australian couples (Noller & Shum, 1990). In their study, the couples' version was used, and the authors concluded that the FACES III was best interpreted using a 10-item cohesion factor, and a 7-item change factor. The two factors recommended by the developers of the FACES (cohesion and adaptability) were considered orthogonal as the factor correlation was very low (r = .03). However, Noller and Shum (1990) disagreed and said that the correlations between the two factors were much higher than those originally reported (.41 and .36 for the two samples used). In a study using 183 high school seniors and college undergraduates (Perosa & Perosa, 1990), it was also discovered that the relationship between the two scales (cohesion and adaptability) was correlated (r = .33). Perosa and Perosa also concluded that attempts to reduce family functioning to the basic constructs of cohesiveness and adaptability are premature.

Internal consistency reliability coefficients were .77 for cohesion, .62 for adaptability, and .68 for the total FACES III, based on a sample of 2,412 families with normal children. Test/retest reliabilities for a 4- to 5-week interval were also reported and were .80 and .83 for adaptability and cohesion, respectively (Olson et al., 1985).

Initial scoring procedures for the FACES III were quite complex as several scores for each scale could be computed. Respondents filled out the items for both perceived and ideal situations. Thus, discrepancy scores were also available. In addition, it was hypothesized that the scoring was nonlinear. Both extremes, too much or too little adaptability or cohesion, represented an unbalanced family type. This scoring system was later revised (Olson, 1991) to a linear scale. Thus, on both scales, higher values represented more balanced family functioning. It is unclear, however, how this change in scoring procedures affected previously established relationships.

Normative information is also available for the normal sample. This is presented as means, standard deviations, and cut-off points for various categories of family adaptability and cohesion based on the nonlinear scoring scheme (Olson et al., 1985), and again for the linear scoring scheme (Olson, 1991).

Validity estimates were initially limited to just concurrent validity correlations with the FACES II. More recently, one study has examined concurrent validity for the FACES III using subject families with children with disabilities (Mortensen, 1991). In this study, 503 families with children from birth to 5 years of age with disabilities were employed. Concurrent validity of the FACES III was examined by computing correlations with a number of family demographics and other family measures. Results indicated that the adaptability scale did not correlate with anything, and that the cohesion scale correlated at small magnitudes ($.20 < \underline{r} < .30$) with income, family resources, parent education, family and social support, stress, and life events. In

addition, normative data indicated that these families were similar in cohesiveness with the authors normative group, but were far more rigid than the normative data originally reported. The author concluded that the FACES III exhibited correlations with other family measures that were in the predicted direction for the circumplex model.

The Family Inventory of Life Events and Changes

The psychometric adequacy of the FILE has been assessed using several samples. Normative data were extracted from a sample of 980 couples from a broad range of ages and child life stages. Reliability data was determined using a sample of 2,740 subjects. The internal consistency reliability for the overall FILE score was .81, and ranged from .16 to .72 for the nine subscales. Test/retest reliabilities were similar, with the overall correlation for the total FILE being .80, and ranged from .64 to .84 for the subscales.

Construct validity for the FILE was determined using a subsample of the normative sample (N = 1,330). The factor analysis conducted by the authors is not described in detail. However, the number of factors was determined using the Kaiser-Guttman rule. In addition, some items were not included, and some factor loadings were quite small (below .20). The authors admitted that little can be gained from an analysis like this because of the discrepant distributions involved. Information regarding the concurrent validity for the FILE has not been reported.

The Family Resource Scale

The FRS was normed using a sample of 52 families with children having a variety of disabilities (Dunst & Leet, 1985). Subscale structure was determined using factor analysis. Once again, the number of factors was determined by the Kaiser-Guttman rule, and a principal components extraction with a varimax rotation was employed. From this, four subscale constructs were identified. Concurrent validity coefficients were computed with two other rating scales developed by the authors specifically for this purpose. This correlational analysis showed that the FRS correlated moderately with the variety of well-being and resource items external to the FRS. Internal consistency reliability for the FRS total score was .94.

In a second study (Dunst & Leet, 1987), 45 mothers of preschool-aged children with a variety of disabilities completed the FRS, the Health and Well-Being Index, and the Personal Allocation Scale. The coefficient alpha reliability for the FRS was .92, the split-half reliability coefficient with a Spearman-Brown correction for length was .95, and the test-retest reliability correlation for a 2- to 3-month period was .52. The factor analysis, using a principal components extraction, a varimax rotation, and the Kaiser-Guttman rule for determining the number of factors, produced an 8-factor solution. Correlations with the other measures showed statistically significant relationships with the other measures. The authors concluded that family resources are positively related to health and well-being of the parents as well as their commitment to intervention.

Finally, Burrell (1990), using a small sample (N = 53) of families with young children with disabilities, computed internal consistency reliability coefficients and reported an alpha of .91 for the total FRS score. No other psychometric investigation was conducted.

The Family Support Scale

The psychometric characteristics of the FSS were assessed using 139 families with children having a variety of disabilities (Dunst et al., 1984). Again, the factor analysis of this measure employed the Kaiser-Guttman rule, a principal components extraction, and a varimax rotation. The results of this analysis showed a 6-factor solution. In later analyses, Dunst and Trivette (1986) revised the subscale total to five by collapsing the Nuclear Family items into the Formal Kinship scale. Concurrent validity was given as the correlation between the FSS and the Questionnaire on Resources and Stress (QRS) and the Parent-Child Interaction Rating Scale. Correlations with the QRS were statistically significant ($p < .05$) and ranged from -.14 to -.18. The authors concluded that higher support was related to more integrated family units. In addition, the number of sources of support related to parent-child interaction. The authors concluded that social support is related to variety in parent-child interactions, and overall child development.

Reliabilities for the FSS were reported in several forms. Internal consistency reliability for the total FSS was .77 and the split-half reliability was .75. Test/retest reliability was conducted

over a one-month interval for a total of 25 subjects. Reliability was .47 for the total score and an average of .41 for all items.

Several studies have been conducted that shed some appropriate light on the psychometric properties of the FSS. Burrell (1990), using a sample of families with young children with disabilities, conducted a factor analysis of the FSS using a principal components extraction and a varimax rotation. In her study, she concluded that the structure reported by the original authors was confirmed. Subscale internal consistency reliability coefficients ranged from .42 to .73 and the total score alpha was .80. Again, this study suffered from a very small sample size (N = 53), and factor loadings did nothing to confirm the original scoring procedures.

Dyson and Fewell (1986) assessed 15 families with children between 3 and 6 years of age with a variety of disabilities. Families with children with disabilities showed statistically significantly more support than the comparison group.

In yet another study (Fewell, 1984), 80 mothers of children with Down syndrome were assessed with the FSS and four other measures of family functioning. A factor analysis was conducted with the FSS using the Kaiser-Guttman rule and a principal components extraction. Six factors were extracted and rotated using the varimax method. Following rotation, four factors existed which still had eigenvalues greater than one. These were used for interpretation, and all items that had factor loadings less than .45 were dropped. The factors were named: Parents and Relatives, Spouse and Friends, Outside Helpers, and

Social Groups. Internal consistency reliabilities for these four scales were from .66 to .82.

Dunst, Trivette, Hamby, and Pollock (1990) reported a small relationship between social support, only partly measured by the FSS, and child behavior characteristics. In this study, 47 mothers of young children with disabilities responded to a number of questionnaires while the children were tested using the Carolina Record of Individual Behavior (CRIB; Simeonsson, 1981). The results indicated that the FSS was not at all related to any scales of the CRIB. The author's conclusions were based on analysis that used a combination of measures, including the FSS, to represent the construct of support.

Concurrent validity, computed as correlations with the other scales indicated that the FSS correlated with the Family Social Support Scale (correlations ranged from .14 to .50) and a measure of maternal involvement in their child's education (correlations ranged from -.15 to -.42). The FSS did not correlate statistically significantly with a measure of religious support or the Family Demands and Resources Scale. Overall, the FSS did correlate with measures related to support, and failed to correlate with measures purporting to measure a variety of different constructs (Dunst et al., 1984).

In sum, these five measures of family functioning have been used in a variety of settings with a variety of populations. It is clear that they may be quite useful for the population of families with children with disabilities when additional psychometric information is

available. This study will help alleviate this problem and provide researchers with information on measures that are available, useful, and appropriate for early intervention assessment.

The Battelle Developmental Inventory

In a recent review of the Battelle Developmental Inventory, Sheehan and Snyder (1989-1990) stated that the BDI was an ambitious attempt to measure a variety of developmental domains for children with and without disabilities from 0 to 8 years of age. In addition, they concluded that the BDI lacked validity information for several reported features, and that caution should be applied in interpreting scores from very young children with disabilities. Finally, however, the reviewers concede that this is not at all unusual for any early childhood developmental measure.

Such criticisms or concessions regarding the BDI are not unusual. Telzrow (1993) suggested that the BDI suffers from four criticisms: confounds regarding tester choice of format for blind or deaf subjects, insufficient "floor" for young or low functioning children, failure to control for socioeconomic status, and poorly validated age cutoffs. One other criticism of the BDI is that it lacks predictive validity for later social-behavioral development (Merrell & Mauk, 1993).

In regard to the first criticism, the BDI formats were standardized at the Early Intervention Research Institute. Thus, the choice of stimuli for diagnosticians testing subjects with visual or hearing impairment was controlled. Thus, these confounds are irrelevant for this study.

Several studies regarding the concurrent validity of the BDI for young children with disabilities have been conducted (Boyd, Welge, Sexton, & Miller, 1989; McLean, McCormick, Bruder, & Burdg, 1987; Mott, 1987; Sexton, McLean, Boyd, Thompson, & McCormick, 1988). In each of these cases, high correlations with other measures of development (e.g., Bayley Scales of Infant Development, Peabody Picture Vocabulary Test, Vineland Social Maturity Scales) have been reported. In addition, Snyder, Lawson, Thompson, Stricklin, and Sexton (1993) suggested that the factor structure for the BDI is stable over time and across a wide range of child ages. This, and a plethora of concurrent validity for the BDI with this population, would suggest that the BDI is less suspect for young children with disabilities than has been suggested.

Taylor, Mauk, and Allen (1993) conducted a generalizability study for the BDI using data from the Early Intervention Research Institute's longitudinal studies. In that study, they found no statistically significant variance accounted for by family income. This would suggest that socioeconomic status is not a mediating variable when considering both the scoring and interpretation of the BDI.

McLinden (1989) also criticized the standard scores of the BDI because of the age cutoffs. Testing a subject close to and after an age cutoff could result in vastly different scores than those if tested close to and before that age cutoff. Ashmore, Saylor, Foster, and Casto (1991) used this same argument to urge caution when using the BDI for placement decisions. Despite the warranted criticisms of

the BDI standard scores, the BDI age equivalent scores have not been included with the developmental quotients in that criticism. In fact, the BDI is well regarded as a criterion-referenced test (McLinden, 1989), and was used for that purpose in the longitudinal studies (White et al., 1994).

Finally, although the BDI has been criticized for its lack of predictive validity for social-behavioral development (Merrell & Mauk, 1993), that criticism was again based on standard scores, not age equivalent or raw scores. In addition, the evaluation of child social skills, measured by the Social Skills Rating System (SSRS; Gresham & Elliott, 1990), may have suffered from similar measurement problems. Thus, the low correlations between the BDI and later SSRS scores could have been caused by noise from both sources.

In total, the BDI suffers from poor standard scores exacerbated by questionable age cut-off points; however, these same criticisms do not apply to age equivalent or raw scores. Otherwise the BDI shows good concurrent validity with several other measures of child development. In addition, the BDI shows relatively high internal consistency and interrater reliability scores (McLean et al., 1987; Sexton et al., 1988), and the validity and reliability extend to special populations.

Previous Work from EIRI

The professional staff of the Early Intervention Research Institute (EIRI) have conducted several studies related to family functioning and drawn from the longitudinal studies data. Four of

these studies discuss some of the relationships between these five measures and between family functioning and child development. Although these studies address issues covered in this dissertation, they are conducted without any psychometric considerations, and use somewhat smaller subsamples. Despite the fact that many reports from EIRI have included family functioning data, few have presented critical psychometric evidence. Four studies which provide such evidence are presented here.

In an unpublished manuscript, Waidler and Pezzino (n.d.) reported the results of an analysis that examined the correlates of stress. This subsample (N = 111) came from two longitudinal studies, and included families with children with a variety of disabilities. The authors were investigating the relationship between parent stress and family support and resources for varying levels of life stress as measured by the FILE. The authors concluded that the data support the ABCX model proposed by Hill; that is, families experiencing different amounts of life events utilize their resources differently.

Data reported in this study indicated a high and statistically significant relationship between the PSI total scores and the FRS total score (r = -.34 to -.57), the FILE total score (r = .35 to .50), and the FSS total score (r = -.33 to -.41). In addition, the data indicated a low and statistically nonsignificant relationship between the PSI total scores and child development (r = -.02 to -.08), child age (r = -.15 to -.18), maternal education (r = -.04 to -.10), and maternal age (r = .00 to -.05). This information demonstrates the overlapping nature of family functioning assessment. Unfortunately,

this sample is not necessarily representative of populations of families with children with disabilities in many respects. In addition, this study failed to address the underlying structures of the instruments, and thus distilled the constructs' measurement before analysis.

Using a much larger sample (N = 503 to 982, depending on the analysis), Pratt (1992) examined the relationship between a variety demographic variables, family functioning variables (excepting the FACES III), and child functioning variables. Again, moderate to high relationships existed between the PSI total and the other family measures (FRS total, r = -.42; FSS total, r = -.29; and FILE total, r = .34). As would be expected, similar levels of correlation existed between the FRS, FSS, and FILE. Child functioning, as measured by the BDI cognitive age equivalent score, did not correlate highly with any of the family functioning measures with the exception of the PSI child domain total (r = -.21). These findings do not disagree with Waidler and Pezzino (n.d.). Again, however, no psychometric evaluation was conducted.

Also using a large sample (N = 725), Innocenti, Huh, and Boyce (1992) examined the differences in stress between their sample and the normative sample described in the PSI manual. The authors concluded that the differences only occurred for scores on the child domain of the PSI, and that the distributions of scores for the sample with children with disabilities were normal.

Finally, Boyce, Behl, Mortensen, and Akers (1991) examined the relationship between the PSI and a variety of demographic variables,

as well as other family and child functioning variables for a subsample of 429 families. In reality, this study and the Pratt (1992) study do not differ in substance, and the relationships do not substantially differ. However, Boyce et al. examined FRS subscale scores as well as totals for the FSS, FILE, and FACES III adaptability and cohesion scores. The authors concluded that a variety of variables mediate the scores found on the PSI and should be considered by clinicians when interpreting scores.

Reported correlations indicated that the relationships mentioned above hold for this subsample as well. In addition, a higher correlation existed between the parent domain and all other family functioning variables than it did for the child domain and those same family functioning variables. Correlations for the FACES III cohesion scale indicate that these scores correlate modestly with the FRS total ($\underline{r}$ = .30), the FSS total ($\underline{r}$ = .25), the FILE total ($\underline{r}$ = -.13), the PSI child domain ($\underline{r}$ = -.23), and the PSI parent domain ($\underline{r}$ = -.27). Correlations for adaptability, with those same measures was essentially zero. Child development was most highly related to the PSI child domain ($\underline{r}$ = -.27), and time resources ($\underline{r}$ = .13). Other correlations for family functioning and child development were lower or statistically insignificant.

In general, these studies indicate that there is a modest relationship between all of the family constructs measured by the five questionnaires with the exception of the FACES III adaptability scale. In addition, the information from these studies shows that the child domain of the PSI is the best and possibly the only predictor of child

development. This may be a product of the fact that these measures were either not validated for this population, or that the validation was not complete and not conducted with an appropriately large sample.

If differences do exist between families with and without children with disabilities, then it is very likely that the underlying structures may vary as well. A complete psychometric investigation can only serve to improve what has come before and what is to follow.

Psychometric Tools

A number of psychometric tools are available to conduct an evaluation of these measures. In addition to the more traditional computations of norms, reliabilities, and concurrent validity correlations, both item analysis and exploratory and confirmatory factor analysis are also useful in determining the utility of these measures.

Normative data are typically reported in the form of means, standard deviations, and percentile scores. The normative data may be used for comparison to samples or individuals. This information, in turn, can be used to describe or prescribe for both samples and individuals. The normative data alone are insufficient for this purpose, however, as reliability and validity information is essential for deriving meaning from those norms for the specific sample or individual.

Test reliability is the consistency of a measure. This can be assessed across time, testers, test forms, samples of respondents, halves of tests, and within the test itself. Reliability across forms

requires that additional forms be available, but in all of these cases this does not apply. Split-half reliability is usually conducted with tests that contain pairs of similar items. This provides a simple way to conduct what looks like a two-form comparison with only one administration of the test. The items of these measures do not fit this mold, and therefore, this type of reliability is not useful. Reliability across testers, again, does not apply because only one tester (i.e., the respondent) is ever used for any one administration of the test. Thus, for these types of measures, reliability is best assessed across time, samples, and internally, using Cronbach's alpha (Cronbach, 1951).

Validity, the degree to which a test measures what it purports to measure, has traditionally been broken up into construct, content, concurrent, and predictive validity. All of these facets of validity overlap to a certain degree and are essentially addressing the same thing, accuracy, or how the instrument measures what it purports to measure (Messick, 1989). The idea behind content validity is that experts in the field judge the appropriateness of items on a test. This is usually done during test construction. Predictive validity requires that something (usually a group affiliation) is measured at a time following the administration of the measure being evaluated.

The most typical estimation of validity for the types of measures typically used in assessing the efficacy of early intervention, is done using the correlations between the test of interest and a variety of variables both related and unrelated to the measure. This helps determine how well the measure converges on a

construct, and how well it discriminates from other constructs. In addition, and done less frequently, is the exploration of the internal structure of a measure using factor analysis. This technique is often used as a means for supporting the construct validity of the measure (Gorsuch, 1983).

Item analysis is useful in identifying vaguely worded or misleading items. It can also be used to lengthen or shorten a measure by eliminating items that are biased, inappropriate, or redundant (Anastasi, 1988). Traditionally, item analysis is conducted during the construction of a measure. An appropriate means for identifying weak items particular to a specific population after test construction again uses factor analysis. Those items that do not correlate with other items, or test score totals, and thus may be measuring an alternative construct, often show weak communalities.

Confirmatory factor analysis, or structural equation modeling, is very useful in psychometric analysis. First, it can be used to confirm a scale structure either identified by common sense, or by an exploratory factor analysis (Loehlin, 1992). In addition, structural equation modeling can be used to help establish a measure's invariance or stability across different samples, as another indicator of reliability. Confirmatory factor analysis can also help improve scale structure using modification indices (Joreskog & Sorbom, 1989). These indices indicate the change in chi-square value when an additional path in the model is allowed to vary. Large modification may indicate places for improvement in the measurement model.

By using a variety of different techniques, it is possible to collect valuable information for deciding how useful instruments are for evaluating the outcomes specific to a population and the environment in which they were measured. Specifically, these techniques allow a judgment of the degree to which scores from different instruments are related, and consequently, what kinds of scores from various instruments are most useful.

CHAPTER III

PROCEDURES

The conceptual framework for these studies can be best understood using a general systems theory perspective (e.g., Bandura, 1977; Bronfenbrenner, 1977; Ramey, McPhee, & Yeates, 1982). Several principles from this theory form an important framework for this project. First, children are the product of a variety of "systems," and one crucial system is the family. Secondly, the birth of a child with a disability impacts substantially on two interrelated systems, the child (a primary system) and the larger system of the family. Thus, intervention strategies must impact several different systems, including the child, the family, and the community. This conceptual base suggests that assessment at each level is also important. This project addresses assessment of the family system.

The EIRI data set consists of 922 children and their families who were participating in a variety of different types of intervention programs. In all, these data came from families who participated in 19 different studies. These studies addressed three different issues important to early intervention: the effects of varying the intensity of intervention, the effects of beginning intervention at different ages, and the effects of variation in program components.

Although these studies only addressed one of these three issues, and were carried out by different professionals across the country, they did have common study elements. All of these studies included random assignment to groups, impartial data collection for the individually administered tests (e.g., the Battelle Developmental

Inventory), extensive treatment varification, technical assistance with ongoing service programs, and assessment of program costs (Casto & White, 1993).

Collectively, these studies represent the second generation of early intervention research, being specific in nature, assessing efficacy from a global perspective, and holding to rigorous scientific standards (Guralnick, 1993). Table 3 provides information about this sample of children (for further information on the types of intervention programs and testing procedures, see White et al., 1987).

As can be seen from the data in Table 3, children and families included in this large data set represent a wide variety of demographic characteristics, types of early intervention programs, types and severities of disabling conditions, and geographic locations across the country. Thus, data from this sample can be used to generalize findings to most special populations. Because it is a relatively large data set of children who are participating in the types of programs typically offered, it provides an ideal opportunity to assess the psychometric soundness of measures of family functioning as they will typically be used in conjunction with assessing the efficacy of early intervention programs.

Instrumentation

This section will describe the measures to be analyzed in this study and a brief overview of the psychometric information currently available on each instrument, specifically targeting information

Table 3

Description of Sample (N = 922)

Description			
Demographic Characteristics			
Ethnicity of Child			
Caucasian	80%	Asian American	1%
African American	15%	Hispanic American	2%
Native American	2%		
Maternal Age	Mean = 30	SD = 7	Range = 15 to 50
Maternal Education (yrs)	Mean = 12.9		Range = 4 to 17
Maternal Marital Status			
Married	79%		
Widowed	1%		
Separated	6%		
Divorced	5%		
Single	10%		
Paternal Age	Mean = 32	SD = 7	Range = 17 to 62
Paternal Education (yrs)	Mean = 13.2		Range = 4 to 19
Paternal Occupation			
Unemployed	8%		
Technical	22%		
Unskilled	23%		
Professional	15%		
Blue Collar	32%		
Income ($)	Median = 22,500		
Number of Siblings	Mean = 1.4	SD = 1.4	Range = 0 to 10
Characteristics of Children			
Age of Children at at Assessment (months)	Mean = 27	SD = 19	
Gender of Children	Male = 60%	Female = 40%	
Type of Disability			
Hearing Impaired	6%	Developmental Delay	19%
Visually Impaired	5%	Multiple Disabilities	5%
Motor Impaired	3%	IVH	20%
Cognitively Impaired	5%	Down Syndrome	16%
Language Impaired	8%	Cerebral Palsy	4%
Health Impaired	3%	Other	6%

(table continues)

Description	
Developmental Functioning(DQ)	
40 and below	11%
56 - 70	29%
41 - 55	18%
70 and above	42%
Nature of Early Intervention Programs	
Frequency of Contact (Type of Intervention)	
Once per month	22%
Home-based	41%
1x/month - Center-based	41%
once per week	25%
Combined home - > 1x/week	53%
Center-based	18%
Region of Country	
East	6%
Southeast	36%
Midwest	27%
West	31%

relevant for use with children having disabilities, their families, and early intervention professionals.

Five measures of family functioning will be analyzed in this project. These include the Parenting Stress Index, the Family Adaptability and Cohesion Evaluation Scales, the Family Support Scale, the Family Resources Scale, and the Family Inventory of Life Events and Changes. What follows is a description of each measure, including the number of items and indices derived from them. In addition, a child outcome measure, the Battelle Developmental Inventory, will be described.

Description of Measures

The Parenting Stress Index

The Parenting Stress Index (PSI) has 120 items that measure stressors associated with parenting and being a parent. The scale is divided into three main subscales. The first two, child-related stress and parent-related stress, are measured by 101 statements where the response scale is Likert and ranges from "strongly agree" to "strongly disagree." The third scale is 19 items in length and records the existence (or nonexistence) of life events during the last year. Because this information is directly measured in the FILE, it was not coded as a part of this study.

The child-related stress scale covers stress related to the child that most concerns the respondent. This scale is further divided into six subscales: adaptability, acceptability, demandingness, mood, distractibility/hyperactivity, and reinforces parent. The parent-related stress scale is also divided into subscales: depression, attachment, restrictions of role, sense of competence, social isolation, relationship with spouse, and parent health. The PSI yields scores for each subscale, the three main scales, and a total stress score which is the sum of the child- and parent-related stress scores. Lower scores represent less stress.

The Family Adaptability and Cohesion Evaluation Scales

The Family Adaptability and Cohesion Evaluation Scales (FACES III) uses 20 items (used for each of the perceived and ideal sections and thus there are 40 total items) that measure both the perceived and

ideal adaptability and cohesion of the respondent's family. The test presents descriptive statements about family behaviors, attitudes, and feelings. Item responses are on a Likert scale with responses ranging from "almost never" to "almost always." The FACES III yields a total score for both adaptability and cohesion, and also yields a discrepancy score, computed as the difference between the ideal and perceived responses.

Total scores can be used to classify the family type. Cohesion is broken down into four blocks: disengaged, separated, connected , and very connected. The higher the score, the more the family moves from disengaged to very connected. Adaptability is also broken down into four blocks: rigid, structured, flexible, and very flexible. The higher the score, the more the family moves from rigid to very flexible. High scores on both scales implies a balanced family type. Decreasing scores imply a less well balanced family type (Olson, 1991).

The Family Resources Scale

The Family Resources Scale (FRS) is a 30-item questionnaire that measures the adequacy of time and economic resources for families with small children. Respondents use a Likert scale ranging from "not at all adequate" to "almost always adequate." The FRS has four subscales: general resources, time availability, physical resources, and external support. The FRS yields scores for each of the subscales and a total score, with higher scores indicating more resources for the respondent's family.

The Family Support Scale

The Family Support Scale (FSS) is an 18-item questionnaire that measures the amount of perceived support given to the parents of young children with disabilities. The FSS uses a Likert scale with responses ranging from "not at all helpful" to "extremely helpful." If an item, such as "Parent Groups," is not applicable for the respondent, then the item is crossed out or not answered and the response is judged "not applicable." The FSS measures support from family, friends, social groups, and professional service providers. Three types of scoring can be used. First, total scores, which may be used for each of the subscales as well as the overall score, are computed by adding up the Likert scores for the appropriate items within each scale. Second, the subscale and total number of sources of support can be determined by counting all items that are marked and not deemed "not applicable." Finally, support by source can be determined by dividing the total score by the total number of sources. This yields the average support for those sources which are appropriate for the respondent. In each case, higher scores indicate greater amounts of support.

The Family Inventory of Life Events

The Family Inventory of Life Events (FILE) is a questionnaire that measures the presence (or absence) of 71 life events that may have occurred over the last 12 months to blood relatives or those with whom the respondent has a long-term commitment. The responses are all dichotomous, with only "yes" (the life event or change occurred) or "no" (the life event or change did not occur) as choices. The life

events are broken down into nine sections: intrafamily strains, marital strains, pregnancy and childbearing strains, finance and business strains, work-family transition and strains, illness and family "care" strains, losses, transitions "in and out," and family legal violations. Thus, the FILE yields scores for each of these sections as well as a total score. These scores only reflect the number of items with a positive response, not the magnitude of the life event itself.

The Battelle Developmental Inventory

The Battelle Developmental Inventory (BDI) is an untimed, individually administered assessment battery of key developmental skills in children from birth to 8 years of age. The BDI is both criterion- and norm-referenced, thus providing information on a child's developmental strengths and limitations, as well as comparisons with age-mates, and was specifically designed for use in the assessment of both children with and without disabilities. Scoring of BDI test items is based on a 3-point system: 0 points for behavior not attempted or failed (child does not or cannot perform specified behavior); 1 point for behavior attempted but not meeting the specified criterion (child attempts behavior but does not demonstrate mastery); and 2 points for behavior meeting the specified criterion (child exhibits behavior as described). The BDI is comprised of 341 items grouped into five domains: personal/social, adaptive behavior, motor, communication, and cognition.

Few missing items existed in the entire data set; however, those that were encountered were handled in the same manner as the test

creators handled them. Thus, there was comparability between analyses, and nonresponses were handled in a sensible way.

For the PSI, missing items were scored as a "3," a neutral response. For the FRS, missing items were scored as a "5." Thus, it was assumed for that item that the respondent perceived almost always adequate resources. For the FSS, nonresponses were considered as "not applicable." This is reasonable considering most nonresponses were "not applicable"s that the respondent failed to cross out. For the FILE, a nonresponse was coded as "0." This assumes that the event did not happen to the respondent in the last year. Finally, for the FACES III, nonresponses for perceived items were replaced with the response from the parallel item from the ideal scale. Means were substituted for missing items on the ideal scale. Protocols that contained too many missing items to be considered complete were dropped from the analysis.

Data Analysis Procedures

Figure 1 shows a flow chart of the data analyses. This methodological section will be presented in seven steps. These subsections describe an overall process for dealing with the five measures individually, and then in concert with the BDI. The methodologies used in this study comprise a means of first establishing the three main indices of test usefulness: (a) normative data, (b) reliability , and (c) validity for the purpose of assessing the efficacy of early intervention programs, and

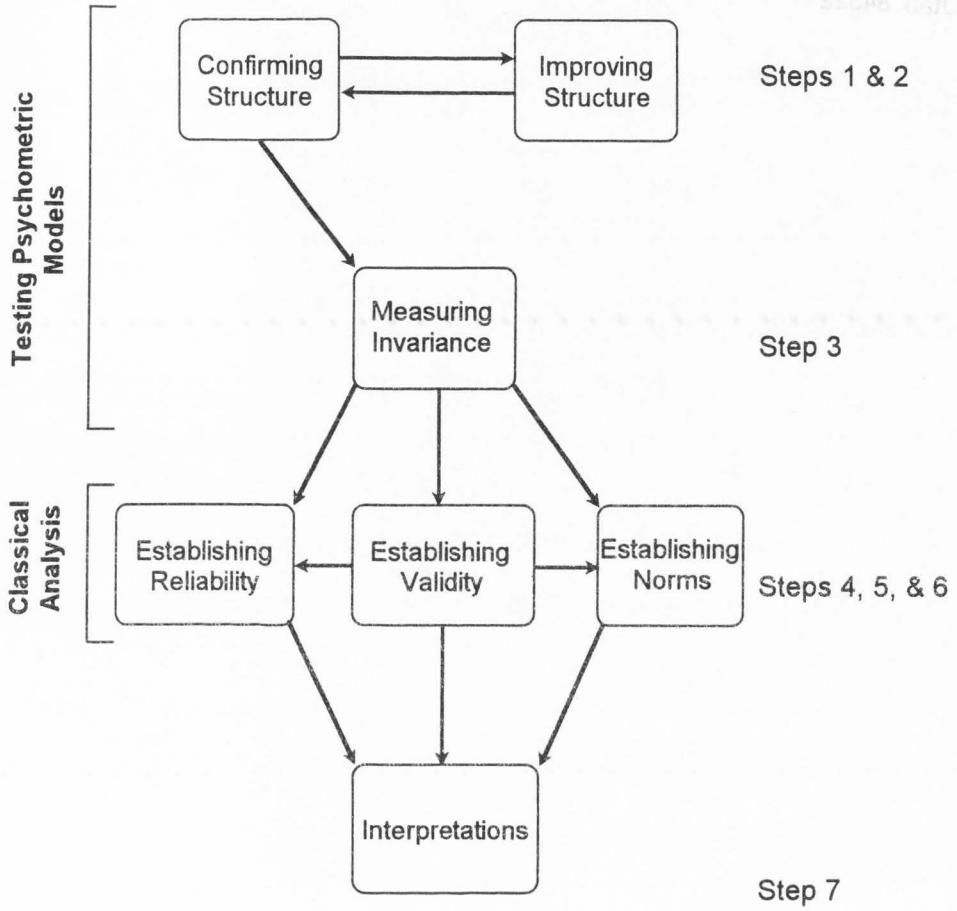

Figure 1. Flowchart of analysis procedures.

providing the relationship to child development. Each of the steps in the data analyses procedure will be described in further detail.

Step 1: Confirming Structure

Confirmation of the structure determines whether the data from this sample "fit" into the scales and subscales as presented by the author of the instrument. Previous structural model analyses have not been conducted on any of the five measures, and the previous factor

analyses have not been conducted with appropriately large samples of families with children with disabilities. Consequently, the reported structure of each measure required verification and modification using a large, representative sample. To confirm the reported structure, a confirmatory factor analysis using structural equation modeling with the LISREL program was conducted. Structural equation modeling uses correlations between measured variables to infer relationships to and between constructs, or unmeasured variables (Loehlin, 1992). For these analyses, items were the measured variables, and the subscales and overall tests represented unmeasured constructs. Information on the strength of an item within a test or subscale, and the relationships between subscales were also estimated with this technique. The "fit" of the data to the model was evaluated using a chi-square statistic, which measured the error in the model. If the chi-square was statistically significant ($p < .05$), then the data did not fit the model (i.e., there was too much error in the model), and the model was not confirmed.

Even if the structure was confirmed, an attempt at improving that structure with this population was done using an exploratory factor analysis described in the next section.

Step 2: Improving Structure

Factor analytic techniques were used to investigate alternative structures that are a more appropriate fit with the data (Gorsuch, 1983). First, a principal components analysis was conducted to identify initial eigenvalues. This gave an early impression of the number of possible factors to be extracted. Following that, a factor

analysis using a clearly low number of factors was conducted. Then, another factor analysis using one more factor was conducted, and so on. At each stage, the content of each item within each factor was examined to determine what construct the factor represented. The items with the highest factor loadings gave the best impression of the construct being isolated (Loehlin, 1992).

For each of the five measures, at some point, the factor structures stabilized (i.e., the factor structure had few double loadings, weak items, and the factors made sense), and the addition of one more factor dissolved that stability. That is, extracting one more factor was a mistake. From this series of analyses, two things became clear. First, the type of rotation, orthogonal or oblique, became apparent. And, second, items that failed to load beyond .30 for any of the analyses were clearly not strongly related to the constructs under investigation.

At this point, the number of factors, the type of rotation, and the weak items were identified. Weak items were eliminated, and another factor analysis was conducted with the appropriate number of factors and the appropriate factor rotation.

Although this technique is not explicitly documented in the literature, it follows from common sense. By definition, strongly loaded items are changed most by changes in the construct, or factor score. Thus, they best represent the nature of the constructs. Items that fail to load are not affected by changes in the construct, or factor score. This implies that they are not related to the constructs under investigation. Their removal from further analysis

helps strengthen both the measurement and structural model. It was beneficial to conduct factor analyses with an array of factors. This helped establish the number of constructs with some certainty.

Both orthogonal (uncorrelated) and oblique (correlated) factor rotations were eventually used. Although orthogonal rotations are traditional for most factor analyses, oblique solutions were used for the measures whose subscales were a partition of one overall construct. For example, the PSI measures several aspects of stress related to parenting. Thus, it is likely that stress due to one aspect of parenting is correlated with another. Orthogonality was not the goal.

Step 3: Reconfirming Structure

When the "best" structure was identified, it was confirmed using the techniques outlined in the previous section (see confirming structure). The "best" fit, as defined by reliabilities, goodness-of-fit indices, and common sense, was adopted for the rest of the psychometric processes. It was this scoring scheme that was eventually correlated with the BDI.

This process worked well for four of the five measures. The FILE was not put through the above analyses because the responses were dichotomous and the variances across items were widely discrepant. In addition, the FILE is a checklist of life events, and it is not clear that events correlate with other similar events. For example, the death of a spouse should not necessarily correlate with the death of a friend; however, one would expect these items to be grouped together on a measure like this. Factor analysis, thus, would not necessarily

group like items together, and was therefore not employed. For this reason, the FILE was examined in a completely different way.

No statistical analyses were employed to group the items. The author grouped the items based on item content. First, items were identified as events or changes. Event items were those that represented an occurrence. Change items were those that represented an increase or decrease in something over time. Second, the items were grouped by the family system they affected. This would include: the family as a whole, the respondent individually, the respondent's spouse, parents, in-laws, children, relatives, friends, and coworkers.

Finally, the items were grouped by the type of event or change. This would include: conflict, separation, illness, sexual conflict, pregnancy, debt (a subscale of financial changes that focused on debt alone), work related events (also a subscale of financial changes that focused on the workplace), financial changes, death, and legal problems. Together with the FILE total, there were 22 scales with many items included in more than one scale. For example, item 17, "Increased conflict with in-laws or relatives," would be counted in four scales. First, the item was a non-event, or an increase in something over time. Second, this item includes two family systems, both in-laws and relatives. Finally, the item content was one of conflict. Thus, item 17 of the FILE would be part of four scales. The breakdown for the FILE is contained in Appendix A.

Step 4: Measuring Invariance

Once the structure of the measure was identified, the stability, or invariance, was investigated using a two-group confirmatory model

in LISREL (Joreskog & Sorbom, 1989). In this procedure, the sample was randomly split into two groups. Covariance matrices for all measured variables in each group were computed and compared. Models for the two groups were tested independently, then simultaneously. The difference in chi-squares, with its associated probability level, confirmed the reliability of the subscale structure for multiple samples.

This analysis gave additional information regarding the stability of the measures. Because the models for the two groups, in the case of all four measures that were factor analyzed, were estimated to be similar, then the common model was invariant across samples.

Steps 5-6: Establishing Norms

Because these analyses were completed with a unique population, a full description of normative data will help future users to more properly interpret their data. These norms are reported as item and scale means, standard deviations, and ranges.

Establishing reliability. Internal consistency using Cronbach coefficient alphas was computed for each of the subscales and the total scores for each measure using the modified structure. Internal consistency reliability gives some indication of how variance for the individual items relates to the overall scale and subscale variance, and thus, measures the consistency of item response (Crocker & Algina, 1986).

Establishing validity. The validity of the scores from each measure was determined specifically through construct and concurrent

validity. The construct validity was determined by the factor analyses already conducted. Concurrent validity was determined using correlations with other tests hypothesized to measure constructs that both overlapped and did not overlap with the test construct measured. These correlations helped establish the degree to which these scales measured similar constructs, and the degree to which these scales measured unique constructs. In addition, correlations between the five measures and a variety of demographic variables were computed. These correlations also helped establish the credibility of the test validity.

Step 7-8: Outcomes and Regression Analyses

The final stage of this psychometric study was to run correlations with the BDI, interpret the results of the other steps, and come to general conclusions that will help future users of these measures evaluate the efficacy of early intervention research using the relationship between these measures and child development. The results of these procedures are presented in Chapter IV and the conclusions regarding the usefulness of these measures will be summarized in Chapter V.

CHAPTER IV

RESULTS

The results of this investigation will be presented by measure for each of the steps contained in Figure 1. The first section will contain the results of the factor structure confirmation, and the factor analyses. The second section will contain the results of the invariance estimations. The third section will contain the test reliabilities, item and scale means, standard deviations, and ranges, and concurrent validity coefficients. Finally, the fourth section will contain the correlations between family functioning and child development.

Step 1: Confirming Structure

The Family Support Scale

The results of this analysis indicated that the factor structure reported by the authors of the FSS did not fit the EIRI data. Several problems were evident. First, the reconstructed correlation matrix was not positive definite, or could not be inverted without negative values appearing on the diagonal. Thus, the only solution that could be obtained used an unweighted least squares solution. This means of extraction and iteration control uses an identity matrix instead of the inverted reconstructed correlation matrix in its computations (Loehlin, 1992).

The solution for the FSS model produced a chi-square value of 2,298.51 with 135 degrees of freedom. This much error in the model was statistically significant ($p < .001$). The accompanying goodness-

of-fit indices, .69 and .60 for the adjusted goodness-of-fit index were low. Path coefficients for this model ranged in value from .20 to 1.13, creating a wide range of residual variances. The standardized solution was nonsensical. Certain paths could not be computed, and the diagonal elements of the phi matrix, which were all fixed at 1, were recalculated to values other than 1. From these figures, it was determined that the model for the FSS should be reexamined using the EIRI data set.

The Family Resource Scale

The authors' model for the FRS also failed to fit the EIRI data. Again, the reconstructed correlation matrix was not positive definite, and thus an unweighted least squares solution was iterated.

The solution for the FRS model produced a chi-square value of 5,338.50 with 391 degrees of freedom. This much error in the model was statistically significant ($p < .001$). The accompanying goodness-of-fit indices, .81 and .78 for the adjusted goodness-of-fit index were reasonable, but could be improved on. Path coefficients for this model ranged in value from -1.70 to .79, creating a wide range of residual variances. The standardized solution was again nonsensical. Paths could not be computed, and the diagonal elements of the phi matrix, which were again all fixed at 1, were recalculated to values other than 1. From these figures, it was determined that the model for the FRS should be reexamined using the EIRI data set.

The Parenting Stress Index

The PSI was examined in two separate analyses. The first model dealt only with the child-related items and their subscales, and the second model concerned only the parent-related stress items and their subscales.

Child-related stress. In this analysis, the author's model for child-related stress failed to fit the data. The solution for this model produced a chi-square value of 8,431.47 with 1,040 degrees of freedom. This much error in the model was statistically significant ($p < .001$). The accompanying goodness-of-fit indices, .69 and .66 for the adjusted goodness-of-fit index, were very low. Path coefficients for this model stayed within expected extremes; however, some of the items suffered from low path coefficient absolute values. Again, the standardized solution failed to properly converge on reasonable values.

Parent-related stress. In this analysis, the author's model for parent-related stress failed to fit the data. The solution for this model produced a chi-square value of 8,329.47 with 1,384 degrees of freedom. This much error in the model was statistically significant ($p < .001$). The accompanying goodness-of-fit indices, .72 and .70 for the adjusted goodness-of-fit index, were low. Again, path coefficients for this model stayed within expected extremes; however, some of the items suffered from low path coefficient absolute values, and the standardized solution failed to properly converge on reasonable values. From these figures, it was determined that both models for the PSI should be reexamined using the EIRI data set.

The Family Adaptability and Cohesion Evaluation Scales

The authors' model for the FACES III also failed to fit the EIRI data. The solution for this model produced a chi-square value of 5,422.35 with 740 degrees of freedom. This much error in the model was statistically significant ($p < .001$). The accompanying goodness-of-fit indices, .76 and .73 for the adjusted goodness-of-fit index, were reasonable, but could be improved on. Again, path coefficients for this model stayed within expected extremes; however, some of the items suffered from low path coefficient values, and the standardized solution failed to properly converge on reasonable values. From these figures, it was determined that the model for the FACES III should be reexamined using the EIRI data set.

The process of confirming the authors' models, and the failure of the data to do so, suggested that this population is quite different from the normal population in how families function, as measured by these questionnaires; therefore, exploratory factor analyses were conducted on each measure.

Step 3: Improving Structure

The Family Support Scale

The factor loadings (those above .30) and the factor correlation matrix for the final factor analysis of the FSS are presented in Table 4. In the initial analysis, item 19, "Other," was dropped. It was seldom responded to, and did not represent any one thing consistently. Items like this are generally intended to allow respondents room to express what cannot be expressed through items already on the test.

Table 4

Factor Loadings and Factor Correlation Matrix for the FSS Using Principal Components Extraction with an Oblique Rotation

	Familial	Spousal	Social	Professional
My parents	-.777			
My relatives	-.755			
Spouse's parents		-.819		
Spouse's relatives		-.805		
Spouse		-.732		
Spouse's friends		-.485	.496	
Other parents			.782	
My friends			.712	
Parent groups			.626	
Social groups			.575	
Church			.534	
Coworkers			.463	
Professional helpers				.738
Early intervention services				.692
Professional agencies				.643
Family or child's physician				.339

	Familial	Spousal	Social	Professional
Familial	1.000			
Spousal	.163	1.000		
Social	-.186	-.308	1.000	
Professional	-.083	-.058	.262	1.000

They are also there to allow for mistakes made in test construction. That is, if a large number of respondents all reported support from another source, and that source was consistently the same thing, then new versions of the test could account for that and employ a new scoring strategy. In this case, this item showed no gaps in test construction, and was dropped.

As the analyses continued, two other items were dropped. First, item 16, "School/day care center," was dropped because the vast majority of these families did not have a child old enough to attend school. In addition, factor loadings were low and reflected the lack of communality in this item. Second, item 8, "My own children," was dropped, first because factor loadings were low, and second, because very young children with disabilities do not provide the kind of support addressed in the other FSS items. Since many of the families only had the one child (27%), or had just one or two children (63%, with both being very young), this item did not share common variance with other items, or the test as a whole. In fact, item 8 correlated significantly with the number of children in the home (r = .37). Its highest correlation with another FSS item ("Spouse") was only .20. This suggests that for this population, item 8 was measuring more, the number of older nondisabled children in the home and not social support from the respondents' children.

Table 4 shows how the items broke down by scale. Four subscales were extracted and they were designated: familial support, spousal support, social support, and professional support. These scales were quite clear in their content. This and the consistently high loadings provided evidence that this was the best model for the FSS with this population. Notice that there was only one double loading (item 7, "Spouse's friends). In this case, this item was used to score both spousal and social support.

The factor correlation matrix indicated that these factors were related only slightly; however, an oblique rotation provided the

simplest solution. Therefore, the final model called for correlated factors.

The Family Resource Scale

The factor loadings (those above .30 or the highest loading for that item) and the factor correlation matrix for the final factor analysis of the FRS are presented in Table 5. During the course of these analyses, two items were dropped from the FRS. Items 3 ("Money for necessities") and 7 ("Money for monthly bills") were dropped for two reasons. First, they failed to load on the factor which clearly described monetary resources for living necessities. Instead, they both loaded on the factor which, without them, described monetary resources for extras, or non-necessities.

Second, these two items were different from all other items in that they described general domains of expenses, while the other items dealt with specific sources of expense. With this in mind, it is possible that the respondent could perceive enough resources for each individual source of expense, but as a whole, did not perceive such resources. Thus, both of them were on a par with those items sometimes out of financial reach. These items were dropped in favor of clarifying the factor, and because the FRS, without these items, became a uniform list of specific sources of expense, either of time or money.

Three factors were extracted: time resources, monetary resources for necessities, and resources for monetary extras. Interestingly, "Someone to talk to" and "Babysitting" loaded on the time resources scale. Thus, having someone to talk to is correlated with having time

Table 5

Factor Loadings and Factor Correlation Matrix for the FRS Using Principal Components Extraction with an Oblique Rotation

	Time	Necessities	Extras
Time for spouse	-.839		
Time for family	-.801		
Time to keep in shape	-.748		
Time to socialize	-.739		
Time for self	-.671		
Time for children	-.663		
Time for sleep/rest	-.626		
Someone to talk to	-.512		
Babysitting	-.367		
Plumbing		.773	
Heat		.717	
Furniture		.611	
House or apartment		.602	
Food		.552	
Clothes		.476	.305
Toys for children		.402	.323
Dependable transportation		.383	.330
Telephone		.351	
Money to save			.852
Travel/vacation			.778
Money for entertainment			.737
Money for self			.737
Money for special equipment			.568
Medical care			.542
Dental care			.520
Good job for self or spouse			.493
Public assistance			.462
Child care/day care			.210
Time	1.000		
Necessities	-.278	1.000	
Extras	-.422	.432	1.000

resources. That is, the more time resources one has, the more adequate are one's relationships with others. This is evidenced by the correlation between this item and the FSS total score (r = .31), a higher correlation with the FSS and any scale of the FRS. More specifically (at a subscale level), this item correlated with both social support (r = .29) and spousal support (r = .28), but most specifically (at an item level) more with friends (r = .35), than with spouse (r = .20). Also, having adequate babysitting resources provided more time resources.

An additional interesting finding of this analysis was that medical, dental, and child care all loaded on extras. That is, the perception that resources for these items were adequate were related to the perception that resources were adequate for extras like vacations, entertainment, and savings. Considering the current political climate, this is, perhaps, not as startling as it is provocative. Finally, notice that "Telephone" loaded on necessities. It would have been interesting to have administered the FRS to a similar sample some 20 to 30 years ago, and monitor differences in these perceptions.

Three items loaded on two scales, both resources for necessities and resources for extras. These items were "Clothes," "Toys for children," and "Dependable transportation." This does not stretch the imagination. It is possible to perceive any of these items as both necessities and extras.

Finally, the factor correlation matrix showed high correlations between resources for extras and both the other scales. Thus, the final model included correlated factors.

The Parenting Stress Index

An initial investigation of all 101 items showed that the PSI was best described by two factors. These factors, with very few exceptions, divided the items exactly into child-related and parent-related items in the same manner as the author. Thus, no further examination was conducted at this level. All further analyses were conducted separately for the child- and parent-related items as they were described by the author. This provided for a less cumbersome and more meaningful investigation of the PSI.

Child-related stress. Table 6 displays the factor loadings (only the highest loadings for each item) and the factor correlation matrix for the PSI child-related stress scale. Items were deleted if they failed to load highly on any scale, or if they failed to represent the specific content of the factor. Initially, 47 items were analyzed, but in the final analysis, 11 items were dropped. These items were "Child appears disorganized and is easily distracted," "Child will stay occupied with toy for more than 10 minutes," "Child wanders away more than expected," "Child squirms and kicks when dressed or bathed," "Child is easily distracted from wanting something," "Child rarely does things that make me feel good," "My efforts are not appreciated," "Child looks different than expected and it bothers me," "Child overreacts to loud sounds and bright lights," "Child is uncomfortable meeting strangers," and "Child will

get hurt or in trouble as child gains independence."

Three factors were derived from the remaining items: stress related to child ability, stress related to child temperament, and stress-related parent-child interaction. Table 6 presents the items, their contents, and which factor they loaded on. The negative loadings on the items in temperament and the positive loadings on the items in interaction indicated that they should be reverse scored. This is true because of the negative correlations between the interaction factor and the other two factors, thus reversing the meaning of the factor loadings. The actual correlations between scales were all positive despite their representation in the factor correlation matrix.

Not shown in the table are the double loadings (i.e., items with factor loadings above .30 on more than one factor). Four such double loaded items remained; however, none of these were consistent with the content of the factors, and were thus treated as statistical noise and ignored. It is not unlikely that some loadings above .30 will occur by chance when this many paths are computed.

The factor correlation matrix showed relatively low correlations between the scales; however, an oblique rotation provided the best solution. Therefore, these factors were considered correlated for further analyses.

Parent-related stress. Table 7 displays the factor loadings (only the highest loadings for each item) and the factor correlation matrix for the PSI parent-related stress scale. Again, items were deleted if they failed to load highly on any scale, or if they failed

Table 6

Factor Loadings and Factor Correlation Matrix for the PSI Child Scale Using Principal Components Extraction with an Oblique Rotation

	Ability	Temperament	Interact
Not as able as expected	.804		
Does not learn as quickly	.739		
Much harder to care for	.647		
Hard to get used to new things	.603		
Difficulty concentrating	.587		
Makes more demands	.571		
Avoids new toys	.554		
More of a problem	.529		
Sleeping/eating hard to establish	.500		
Trouble adjusting to changes	.486		
More health problems	.484		
Forgotten past learning	.455		
Ability to do or stop doing	.392		
Leaving with sitter problem	.364		
So active exhausting		.683	
More active		.598	
Keeps trying to get what wants		.589	
Cries and fusses		-.531	
Ability to calm child		-.483	
Easily upset		.458	
Does things that bother a lot		.442	
Cries, fusses more than others		.440	
Moody and easily upset		.426	
Some things bother a lot		.424	
Reacts very strongly		.396	
Number of things that bother		-.390	
Always hanging on me		.333	
Crying duration		-.323	
Likes me, wants to be close			.704
Plays with me			.647
Does not like or want to be close			-.614
Smiles less at me			-.604
Does not laugh when playing			-.517
Does not smile as much			-.472
Does not like to be touched			-.437
Wakes in a bad mood			-.338
Ability	1.000		
Temperament	.251	1.000	
Interaction	-.318	-.155	1.000

Table 7

Factor Loadings and Factor Correlation Matrix for the PSI Parent Scale Using Principal Components Extraction with an Oblique Rotation

	Factor Loading
Restriction of Role	
Give up more of life	.736
Life is doing for child	.653
Child needs control life	.626
Unable to do new things	.608
Feel trapped as parent	.536
Unable to do things I like	.535
Being parent harder	.463
Hard to be alone at home	.429
Less time with friends	.418
Attachment	
Expected to have warmer feelings	-.768
Takes long to develop warmth with child	-.741
Never comfortable w/children when young	-.571
Have too many children	-.439
Child does things to be mean	-.410
Guilty about feeling toward child	-.332
Parent Education	
Father's education	.841
Mother's education	.824
Sense of Competence	
Feel capable caring for child	.616
Successful getting to do, not do	.570
Belief about self as parent	.568
Belief about ability to handle	.526
Enjoy being parent	.518
Ability to understand child needs	.482
Spousal Relationship	
Less time with spouse	.849
Spouse not as helpful	.800
Do less with spouse	.766
Child causes problems w/spouse	.705
Less interest in sex	.396

(table continues)

	Factor Loading
Social Isolation	
Others dislike my company	.728
Not as interested in people	.652
No enjoyment at party	.549
Feel alone and friendless	.500
Can talk to others	-.481
Less enjoyment in things	.467
More problems w/in-laws	.372
Guilt for Child	
Guilt for child fussing	.827
Guilt for child misbehavior	.781
Guilt about parenting	.499
Guilty when angry with child	.452
Health	
Health changes	.759
Sicker in last 6 months	.712
Feel good physically	-.668
Birth Stress	
Sadder when left hospital	-.758
Doubts when left hospital	-.754
Sadder home from hospital 1 month	-.681
Doubts since left hospital	-.408

	RR	AT	ED	SC	SP	SI	GC	HE	BS
Restr Role	1.00								
Attach	-.11	1.00							
Education	.05	-.07	1.00						
Sense of Comp	-.15	.20	.06	1.00					
Spouse	.37	-.09	.09	-.15	1.00				
Social Iso	.21	-.12	.05	-.15	.28	1.00			
Guilt	.21	-.22	.08	-.16	.29	.17	1.00		
Health	.28	-.10	.05	-.19	.29	.24	.20	1.00	
Birth Stress	-.28	.14	.03	.16	-.28	-.12	-.21	-.23	1.00

to represent the specific content of the factor. Initially, 54 items were analyzed, but in the final analysis, 8 items were dropped. These items were "I can't make decisions without help," "I have more problems raising my child than expected," "I feel I cannot handle things very well," "My child knows I am his/her parent and wants me more than other people," "I am unhappy with my last clothing purchase," "There are quite a few things that bother me about my life," "Having children is much more expensive than I expected," and "Having a child changed the way I sleep."

Nine factors were derived from the remaining items: restriction of role, attachment, parent education, sense of competence, spousal relationship, social isolation, guilt for child, health, and birth stress. Table 7 presents the items, their contents, and which factor they loaded on.

Six of the seven original scales, with somewhat the same items, were extracted in this analysis with the exception being the depression subscale. The items that constituted this scale were, for the most part, scattered, dropped, or remained in a scale that was renamed "Guilt for child." As can be seen in Table 7, all of the items in this scale dealt directly with the parent's guilt for the condition of the child or their parenting skills, not depression. In the original scoring scheme, the parent education items were part of the sense of competence scale. Notice from the factor correlation matrix in Table 7 that these two scales did not correlate (r = .06) for this sample. Thus, it became an isolated factor that did not correlate with any other factor. Finally, all items that mentioned

the word "hospital" grouped together, and was thus named "Birth stress."

Not shown in the table are the double loadings (i.e., items with factor loadings above .30 on more than one factor). Two such double loaded items remained; however, none of these were consistent with the content of the factors, and were thus treated as statistical noise and ignored. Again, it is not unlikely that some loadings above .30 will occur by chance when this many paths are computed. The negative loadings in the attachment, social isolation and health scales, indicated items that were to be reverse scored. The negative loadings on the birth stress scale indicated that this factor was represented reciprocally, and thus those items were actually not reversed.

The factor correlation matrix showed a wide range of correlations between the scales. With the exception of the parent education scale, as mentioned above, correlations were generally consistently above .15, and thus an oblique rotation provided the best solution. The final model included correlated factors.

The Family Adaptability and Cohesion Evaluation Scales

Table 8 presents the results of the FACES III factor analysis. For this analysis, all items, both perceived and ideal, were included. No items were dropped and an orthogonal rotation was employed. From this, five factors were extracted: ideal cohesion, perceived cohesion, child empowerment, change, and family leadership/responsibility.

This solution was close to the model presented by the original authors and that proposed by Noller and Shum (1990). The cohesion

Table 8

Factor Loadings for the FACES III Using Principal Components Extraction with a Varimax Rotation

	Factor Loading
Ideal Cohesion	
Would feel close to each other	.684
Would think of family activities easily	.661
Togetherness would be important	.652
All would be present for activities	.651
Would consult each other on decisions	.633
Would feel closer to family than others	.606
Members would like to spend free time together	.588
Would approve of others' friends	.586
Would ask each other for help	.506
Would like to do things with just family	.377
Perceived Cohesion	
Think of family activities easily	.734
Members like to spend free time together	.685
Feel close to each other	.673
Togetherness is important	.584
All are present for activities	.583
Consult each other on decisions	.499
Like to do things with just family	.486
Ask each other for help	.454
Feel closer to family than others	.454
Approve of others' friends	.438
Child Empowerment	
Children have say in discipline	.733
Children would have say in discipline	.730
Children's suggestions would be followed	.668
Parents and children discuss punishment	.638
Children's suggestions are followed	.623
Parents and children would discuss punishment	.609
Children make decisions in family	.598
Children would make decisions in family	.579
Change	
Rules would change in family	.606
Rules change in family	.574
Family would change task handling	.498
Family changes task handling	.497
Household responsibilities would shift	.465
Household responsibilities shift	.380

(table continues)

	Factor Loading
Family Leadership/Responsibility	
Different persons would act as leaders	.650
Different persons act as leaders	.539
Hard to identify leader(s) in family	.483
Could tell who does chores	-.458
Would know leader(s) in family	-.452
Hard to tell who does chores	.125

scales remained intact, with cohesion perceived being different than ideal cohesion, which was uncorrelated with all of the adaptability items. The items on the adaptability scales paired up (i.e, parallel items from each perceived and ideal scales loaded together) to form scales independent of perception and idealism. The change factor extracted in Noller and Shum (1990) was a combination of the change and leadership factors extracted in this analysis. Thus, this solution does not differ substantially from previous research, but the final model was the one derived from this sample and had both correlated and uncorrelated factors. That is, the perceived and ideal cohesion was assumed to correlate and the three adaptability scales were also assumed to correlate. The relationship between the cohesion and adaptability scales was assumed to be uncorrelated.

The negatively loaded items in the family leadership scale indicated that these items should be reverse scored. This was consistent with the items' content.

Step 3: Reconfirming Structure

By following the above analyses, the final model for each measure was examined using LISREL (see Appendix B).

The Family Support Scale

The final model for the FSS used four latent variables, a correlated phi matrix, and a maximum likelihood extraction and discrepancy function. The chi-square for this solution was 689.65 with 97 degrees of freedom. Despite the fact that this was a significant chi-square (the error in the model was statistically significant at $p < .001$), the model was far better than the original model proposed by the authors (chi-square of 2,298.51). This improvement was most significantly indicated by the goodness-of-fit index, .91 and the adjusted goodness-of-fit index, .87. In the authors' model, these coefficients were .69 and .60, respectively. Path values for this measurement model were all above .30 and the values of the paths in the structure model (i.e., factor correlations) ranged from .29 to .59.

The Family Resource Scale

The final model for the FRS used three latent variables, a correlated phi matrix, and a maximum likelihood extraction and discrepancy function. The chi-square for this solution was 2,178.52 with 344 degrees of freedom. Despite the fact that this was a significant chi-square (the error in the model was statistically significant at $p < .001$), the model was far better than the original model proposed by the authors (chi-square of 5,338.50). This improvement was also indicated by the goodness-of-fit index, .85 and the adjusted goodness-of-fit index, .82. In the authors' model, these coefficients were .81 and .78, respectively. Path values for this

measurement model, with one exception, were all above .30 and the values of the paths in the structure model ranged from .44 to .68.

The Parenting Stress Index

Again, the PSI was separated into the two separate models for analysis.

Child-related stress. The final model for the PSI child-related stress scale used three latent variables, a correlated phi matrix, and a maximum likelihood extraction and discrepancy function. The chi-square for this solution was 3,258.89 with 591 degrees of freedom. Despite the fact that this was a significant chi-square (the error in the model was statistically significant at $p < .001$), the model was far better than the original model proposed by the author (chi-square of 8,431.47). This improvement was also indicated by the goodness-of-fit index, .82 and the adjusted goodness-of-fit index, .79. In the authors' model, these coefficients were .69 and .66, respectively. Path values for this measurement model, with two exceptions, were all above .30 and the absolute values of the paths in the structure model ranged from .45 to .69.

Parent-related stress. The final model for the PSI parent-related stress scale used nine latent variables, a correlated phi matrix, and a maximum likelihood extraction and discrepancy function. The chi-square for this solution was 2,840.36 with 953 degrees of freedom. Despite the fact that this was a significant chi-square (the error in the model was statistically significant at $p < .001$), the model was far better than the original model proposed by the author (chi-square of 8,329.47). This improvement was also indicated by the

goodness-of-fit index, .88, and the adjusted goodness-of-fit index, .86. In the authors' model, these coefficients were .72 and .70, respectively. Path values for this measurement model were all above .30 and the absolute values of the paths in the structure model ranged from .45 to .69.

The Family Adaptability and Cohesion Evaluation Scales

The final model for the FACES III used five latent variables, both a correlated and an uncorrelated phi matrix, and a maximum likelihood extraction and discrepancy function. The chi-square for this solution was 4,416.71 with 736 degrees of freedom. Despite the fact that this was a significant chi-square (the error in the model was statistically significant at $p < .001$), the model was somewhat better than the original model proposed by the authors (chi-square of 5,422.35). This improvement was also indicated by the goodness-of-fit index, .79, and the adjusted goodness-of-fit index, .77. In the authors' model, these coefficients were .76 and .73, respectively. Path values for this measurement model were above .30 and the absolute values of the paths in the structure model ranged from .36 to .63.

Although this was not a large improvement over the authors' model, it did provide a more detailed look at these constructs and it did perform better in the LISREL analysis. The chi-square and the goodness-of-fit indices improved and so this model of FACES III was used for all subsequent analyses.

With the improvement in chi-square and in the goodness-of-fit indices, it is clear that these models were better models to fit these

data. The statistical significance of the chi-square is overshadowed by the respectable goodness-of-fit indices. Thus, the above models were accepted as the final models for each of the four measures of family functioning for this sample.

Step 4: Measuring Invariance

The process of measuring invariance was consistent with all four measures whose models were tested in the last step (this excludes the FILE). First, the models were tested with two randomly split subsamples where the identical paths for each subsample model were allowed to be different. Then, the analyses were repeated with identical paths for each subsample model being forced to be equal. If there was a significant difference between chi-square values for each of these analyses, this would indicate that the path values for each subsample were significantly different. If not, then this would indicate that forcing them to be equal was no different than allowing them to vary. In the case of the latter, this model is invariant, or stable across subsamples. The results of these analyses indicated that in each case the models were invariant. Probability values for chi-square differences were all above .90.

Step 5: Establishing Reliability

Tables 9 through 13 present the coefficient alpha reliabilities for the total scores and subscale scores of all five measures of family functioning. Reliabilities for the FSS subscales range from .60 to .76 with an alpha of .80 for the FSS total score. The low

Table 9

Internal Consistency Reliabilities for the Family Support Scale

Domain	# of Items	
Familial Support	2	.65
Spousal Support	4	.75
Social Support	7	.76
Professional Support	4	.60
Total FSS	**16**	**.80**

Table 10

Internal Consistency Reliabilities for the Family Resource Scale

Domain	# of Items	
Time Resources	9	.88
Resources for Necessities	9	.81
Resources for Extras	13	.89
Total FRS	**28**	**.92**

Table 11

Internal Consistency Reliability Coefficients for the Parenting Stress Index

Domain	# of Items	
Child Ability	14	.84
Child Temperament	14	.80
Parent/Child Interaction	8	.73
Total Child-Related Stress	**36**	**.89**
Restriction of Role	9	.83
Attachment	6	.68
Parent Education	2	.73
Sense of Competence	6	.67
Spousal Relationship	5	.79
Social Isolation	7	.78
Guilt for Child	4	.73
Health	3	.71
Birth stress	4	.64
Total Parent-Related Stress	**46**	**.91**
Total Parenting Stress	**82**	**.94**

Table 12

Internal Consistency Reliabilities for the Family Adaptability and Cohesion Evaluation Scales III

Domain	# of Items	
Perceived Cohesion	10	.82
Ideal Cohesion	10	.83
Child Empowerment	8	.83
Family Leadership	6	.56
Change	6	.64

Table 13

Internal Consistency Reliability Coefficients for the Family Inventory of Life Events and Changes

Domain	# of Items	
Non-Events	31	.81
Transitions (Events)	33	.66
Affected Family System		
Respondent	23	.72
Family	35	.71
Children	17	.62
Spouse	12	.58
Parents	10	.37
Friends	4	.33
In-Laws	1	--
Relatives	4	.41
Coworkers	1	--
Content of Event or Change		
Conflict	17	.75
Separation	7	.36
Illness	7	.53
Sexual Conflict	3	.25
Pregnancy	3	.29
Debt	13	.58
Work Related	7	.61
Finance	22	.66
Death	4	.30
Legal Troubles	2	.89
Total FILE	**71**	**.82**

subscale reliabilities reflected the small number of items in each scale. The total alpha, which was higher than that reported by the authors (.77) demonstrated a reasonable internal consistency for this type of measure.

Reliability coefficients for the FRS were much higher, ranging from .81 to .89 for the three subscales and .92 for the total score. This was no higher than those reported by the authors, but it did demonstrate strong internal consistency.

Reliability coefficients for the PSI ranged from .64 to .84 for the second order subscales, and .89, .91, and .94 for the two higher order scales and the PSI total. Again, the lower subscale alphas reflected the small number of items found in these scales. Overall, these internal consistency coefficients were not different than those reported by the author and demonstrated a strong internal consistency.

Reliability coefficients for the FACES III were much higher for the cohesion scales, .82 and .83, than they were for the adaptability scales, .56 to .83. Again, the low number of items in the family leadership and change scales contributed to the low alphas; however, these coefficients were higher than those reported by the authors. No total consistency coefficient was computed for the FACES III because a total score represented no single construct, either reported in the literature, or derived in this study.

Finally, reliability coefficients were computed for the FILE and they appear in Table 13. If the life events were uncorrelated, then one would have expected reliabilities to be low. Despite the fact that many of these scales presented low internal consistency, a

surprising number evidenced respectable internal consistency coefficients. Overall, the FILE total alpha was .82, and this may have indicated that life events and changes were correlated to a certain degree.

Overall, the five measures demonstrated internal consistencies at least as high as other similar measures, and in some cases, much higher. This added to the evidence that the subscale structures employed for this sample were consistent and appropriate.

Establishing Norms

The normative data are presented in Tables 14 through 19 and contain means, standard deviations, minimums, and maximums for each item and scale. Mean values for the FSS showed that the full range of scores was represented for each item and scale. The highest sources of support came from the respondents' spouse, parents, professional helpers, and family physician. The lowest sources of support came from parent groups, social groups, and the respondents' coworkers.

Normative information for the FRS showed that the respondents in this sample perceived adequate resources for most of the items. The items in which respondents perceived the least adequacy of resources were money to save, and vacations. The total score average indicated that the perceived resources for every item for this sample were on average 3.97 on the Likert scale (maximum of 5) and represented a response of "Usually adequate." Despite the complete range of responses, this restriction of range on most of the items may have hampered the ability of the FRS to discern actual differences in perceptions of resources for this population.

Table 14

Normative Information for the Family Support Scale

	Mean	(SD)	Minimum	Maximum
Familial	4.21	(2.4)	0	8
My parents	2.41	(1.4)	0	4
My relatives	1.80	(1.3)	0	4
Spousal	6.90	(4.1)	0	16
Spouse's parents	1.65	(1.5)	0	4
Spouse's relatives	1.31	(1.3)	0	4
Spouse	2.75	(1.4)	0	4
Spouse's friends	1.19	(1.3)	0	4
Social	7.88	(5.5)	0	28
Other parents	1.20	(1.2)	0	4
My friends	1.96	(1.2)	0	4
Parent groups	0.76	(1.2)	0	4
Social groups	0.64	(1.1)	0	4
Church	1.32	(1.3)	0	4
Spouse's friends	1.19	(1.3)	0	4
Co-workers	0.81	(1.2)	0	4
Professional	8.06	(3.9)	0	16
Professional helpers	2.62	(1.4)	0	4
Early intervention services	1.97	(1.7)	0	4
Professional agencies	1.20	(1.4)	0	4
Family or child's physician	2.27	(1.3)	0	4
FSS Total	**25.86**	**(10.7)**	**0**	**64**

Table 15

Normative Information for the Family Resource Scale

	Mean	(SD)	Minimum	Maximum
Time Resources	32.68	(7.3)	9	45
Time for spouse	3.36	(1.2)	1	5
Time for family	3.89	(1.0)	1	5
Time to keep in shape	3.29	(1.2)	1	5
Time to socialize	3.29	(1.2)	1	5
Time for self	3.07	(1.3)	1	5
Time for children	4.21	(0.9)	1	5
Time for sleep/rest	3.79	(1.1)	1	5
Someone to talk to	3.94	(1.1)	1	5
Babysitting	3.84	(1.2)	1	5
Necessities	41.41	(4.5)	21	45
Plumbing	4.83	(0.5)	1	5
Heat	4.73	(0.6)	1	5
Furniture	4.55	(0.8)	1	5
House or apartment	4.75	(0.7)	1	5
Food	4.77	(0.6)	1	5
Clothes	4.39	(0.9)	1	5
Toys for children	4.34	(0.9)	1	5
Dependable transportation	4.39	(1.0)	1	5
Telephone	4.66	(0.9)	1	5
Extras	50.23	(10.2)	19	65
Money to save	2.58	(1.4)	1	5
Travel/vacation	2.64	(1.5)	1	5
Money for entertainment	3.35	(1.2)	1	5
Money for self	3.28	(1.3)	1	5
Money for special equipment	3.80	(1.3)	1	5
Medical care	4.33	(1.1)	1	5
Dental care	3.99	(1.3)	1	5
Good job for self or spouse	4.23	(1.2)	1	5
Public assistance	4.55	(1.0)	1	5
Dependable transportation	4.39	(1.0)	1	5
Toys for children	4.34	(0.9)	1	5
Clothes	4.39	(0.9)	1	5
Child care/daycare	4.35	(1.2)	1	5
FRS Total	**111.20**	**(17.5)**	**49**	**140**

Table 16

Normative Information for the PSI Child Scale

	Mean	(SD)	Minimum	Maximum
Ability	35.80	(9.2)	16	70
Not as able as expected	3.29	(1.3)	1	5
Does not learn as quickly	2.99	(1.3)	1	5
Much harder to care for	3.58	(1.2)	1	5
Hard to get used to new things	3.90	(0.9)	1	5
Difficulty concentrating	3.25	(1.2)	1	5
Makes more demands	3.44	(1.1)	1	5
Avoids new toys	3.93	(1.0)	1	5
More of a problem	3.84	(1.1)	1	5
Sleeping/eating hard to establish	3.53	(1.2)	1	5
Trouble adjusting to changes	3.61	(1.1)	1	5
More health problems	2.84	(1.4)	1	5
Forgotten past learning	3.65	(1.1)	1	5
Ability to do or stop doing	2.65	(1.0)	1	5
Leaving with sitter problem	3.70	(1.1)	1	5
Temperament	36.42	(8.1)	14	65
So active exhausting	2.92	(1.3)	1	5
More active	2.92	(1.3)	1	5
Keeps trying to get what wants	1.94	(1.0)	1	5
Cries and fusses	2.74	(1.0)	1	5
Ability to calm child	1.66	(1.0)	1	5
Easily upset	3.61	(1.0)	1	5
Does things that bother a lot	3.26	(1.2)	1	5
Cries, fusses more than others	3.80	(1.1)	1	5
Moody and easily upset	3.71	(1.1)	1	5
Some things bother a lot	3.25	(1.2)	1	5
Reacts very strongly	2.34	(1.1)	1	5
Number of things that bother	1.68	(1.0)	1	5
Always hanging on me	3.71	(1.0)	1	5
Crying duration	1.80	(1.0)	1	5
Interaction	13.79	(4.4)	8	34
Likes me, wants to be close	1.48	(0.8)	1	5
Plays with me	1.44	(0.8)	1	5
Does not like or want to be close	4.29	(1.0)	1	5
Smiles less at me	4.20	(1.0)	1	5
Does not laugh when playing	4.15	(1.0)	1	5
Does not smile as much	4.12	(1.0)	1	5
Does not like to be touched	4.33	(0.9)	1	5
Wakes in a bad mood	4.06	(1.0)	1	5
PSI Child Total	**86.00**	**(17.5)**	**45**	**156**

Table 17

Normative Information for the PSI Parent Scale and PSI Total Score

	Mean	(SD)	Minimum	Maximum
Restriction of Role	25.05	(6.7)	9	45
Give up more of life	2.92	(1.2)	1	5
Life is doing for child	2.57	(1.1)	1	5
Child needs control life	3.36	(1.2)	1	5
Unable to do new things	3.45	(1.1)	1	5
Feel trapped as parent	3.89	(0.9)	1	5
Unable to do things I like	3.64	(1.0)	1	5
Being parent harder	2.97	(1.3)	1	5
Hard to be alone at home	3.08	(1.3)	1	5
Less time with friends	3.07	(1.2)	1	5
Attachment	10.87	(3.4)	6	27
Expected to have warmer feelings	4.32	(0.9)	1	5
Long to develop warmth w/child	4.39	(0.8)	1	5
Never comfortable w/children	4.07	(1.0)	1	5
Have too many children	4.18	(0.9)	1	5
Child does things to be mean	3.98	(1.1)	1	5
Guilty about feeling toward child	4.19	(0.8)	1	5
Parent Education	6.33	(1.8)	2	10
Father's education	2.88	(1.1)	1	5
Mother's education	2.79	(1.0)	1	5
Sense of Competence	12.08	(3.1)	6	27
Feel capable caring for child	2.04	(0.9)	1	5
Successful getting to do, not do	2.14	(0.9)	1	5
Belief about self as parent	2.02	(0.9)	1	5
Belief about ability to handle	2.33	(0.8)	1	5
Enjoy being parent	1.52	(0.7)	1	5
Ability to understand child needs	2.04	(0.8)	1	5
Spousal Relationship	12.77	(4.6)	5	25
Less time with spouse	3.40	(1.3)	1	5
Spouse not as helpful	3.52	(1.4)	1	5
Do less with spouse	2.95	(1.3)	1	5
Child causes problems w/spouse	3.84	(1.1)	1	5
Less interest in sex	3.51	(1.2)	1	5

(table continues)

	Mean	(SD)	Minimum	Maximum
Social Isolation	15.23	(4.7)	7	32
Others dislike my company	3.87	(0.9)	1	5
Not as interested in people	3.80	(1.0)	1	5
No enjoyment at party	3.95	(0.9)	1	5
Feel alone and friendless	3.92	(1.0)	1	5
Can talk to others	2.29	(1.1)	1	5
Less enjoyment in things	3.69	(1.0)	1	5
More problems w/in-laws	3.83	(1.1)	1	5
Guilt for Child	9.19	(2.9)	4	20
Guilt for child fussing	3.66	(1.0)	1	5
Guilt for child misbehavior	4.06	(0.8)	1	5
Guilt about parenting	3.88	(0.9)	1	5
Guilty when angry with child	3.21	(1.2)	1	5
Health	7.14	(2.5)	3	15
Health changes	3.54	(1.1)	1	5
Sicker in last 6 months	3.53	(1.2)	1	5
Feel good physically	2.21	(0.9)	1	5
Birth Stress	8.97	(3.3)	4	20
Sadder when left hospital	3.73	(1.2)	1	5
Doubts when left hospital	3.71	(1.3)	1	5
Sadder home from hospital 1 month	3.69	(1.1)	1	5
Doubts since left hospital	3.90	(1.1)	1	5
PSI Parent Total	**107.64**	**(22.0)**	**49**	**186**
PSI Total	**193.64**	**(35.0)**	**95**	**318**

Table 18

Normative Information for the FACES III

	Mean	(SD)	Minimum	Maximum
Ideal Cohesion	43.31	(5.3)	19	50
Would feel close to each other	4.74	(0.6)	1	5
Would think of family activities	4.44	(0.8)	1	5
Togetherness would be important	4.79	(0.6)	1	5
All would present for activities	4.48	(0.8)	1	5
Would consult on decisions	4.12	(1.0)	1	5
Would feel closer to family	4.35	(1.0)	1	5
Members would spend time together	4.19	(0.8)	1	5
Would approve of others' friends	4.28	(0.9)	1	5
Would ask each other for help	4.19	(0.9)	1	5
Would do things with just family	3.75	(1.0)	1	5
Perceived Cohesion	39.30	(6.3)	16	50
Think of family activities easily	3.80	(1.1)	1	5
Members spend free time together	3.76	(1.0)	1	5
Feel close to each other	4.44	(0.9)	1	5
Togetherness is important	4.59	(0.8)	1	5
All are present for activities	3.97	(1.1)	1	5
Consult each other on decisions	3.34	(1.2)	1	5
Like to do things with just family	3.61	(1.0)	1	5
Ask each other for help	3.73	(1.0)	1	5
Feel closer to family than others	4.06	(1.1)	1	5
Approve of others' friends	4.00	(1.0)	1	5
Child Empowerment	20.58	(5.8)	8	38
Children have say in discipline	2.33	(1.1)	1	5
Children would say in discipline	2.78	(1.1)	1	5
Children's sugs would be followed	2.94	(1.0)	1	5
Parents/children discuss punish	2.77	(1.3)	1	5
Children's sugs are followed	2.65	(1.0)	1	5
Parent/child would discuss punish	3.48	(1.2)	1	5
Children make decisions	1.66	(0.9)	1	5
Children would make decisions	1.97	(0.9)	1	5
Change	16.42	(3.9)	6	30
Rules would change in family	2.31	(1.0)	1	5
Rules change in family	2.32	(1.0)	1	5
Family would change task handling	3.00	(1.1)	1	5
Family changes task handling	2.75	(1.0)	1	5
House responsibilities would shift	3.40	(1.2)	1	5
House responsibilities shift	2.64	(1.2)	1	5

(table continues)

	Mean	(SD)	Minimum	Maximum
Family Leadership/Responsibility	12.66	(4.0)	6	30
Different persons would be leaders	2.46	(1.2)	1	5
Different persons are leaders	2.43	(1.3)	1	5
Hard to identify family leader(s)	1.80	(1.1)	1	5
Could tell who does chores	3.88	(1.2)	1	5
Would know leader(s) in family	4.13	(1.3)	1	5
Hard to tell who does chores	1.97	(1.2)	1	5

Table 19

Normative Information for the Family Inventory of Life Events and Changes

	Mean	(SD)	Minimum	Maximum
Increase in father's time away	.39	(0.5)	0	1
Increase in mother's time away	.21	(0.4)	0	1
Family member has emotional probs	.23	(0.4)	0	1
Family member w/drug/alcohol prob	.05	(0.2)	0	1
Increase in spousal conflict	.24	(0.4)	0	1
Increase in parent/child conflict	.21	(0.4)	0	1
Increase in sibling conflict	.20	(0.4)	0	1
Increase diff managing teenagers	.08	(0.3)	0	1
Increase diff managing school kids	.13	(0.3)	0	1
Increase diff managing preschooler	.22	(0.4)	0	1
Increase diff managing toddlers	.14	(0.4)	0	1
Increase diff managing infants	.12	(0.3)	0	1
Increase outside child activities	.49	(0.5)	0	1
Increase disagree about activities	.17	(0.4)	0	1
Increase in unresolved issues	.21	(0.4)	0	1
Increase in unfinished chores	.41	(0.5)	0	1
Increase in in-law conflict	.18	(0.4)	0	1
Spouse/parent separated, divorced	.12	(0.3)	0	1
Spouse/parent has "affair"	.04	(0.2)	0	1
Increase diff with ex-spouse	.09	(0.3)	0	1
Increase diff in sex relationship	.15	(0.4)	0	1
Unwanted or difficult pregnancy	.13	(0.3)	0	1
Unmarried family member pregnant	.08	(0.3)	0	1
Family member had abortion	.01	(0.1)	0	1
Family member gave birth/adopted	.23	(0.4)	0	1

(table continues)

	Mean	(SD)	Minimum	Maximum
Took loan for increased expenses	.25	(0.4)	0	1
Went on welfare	.14	(0.4)	0	1
Hurt family business	.09	(0.3)	0	1
Hurt family investments	.05	(0.2)	0	1
New business started	.07	(0.3)	0	1
Purchased or built a home	.11	(0.3)	0	1
Purchased car or other major item	.35	(0.5)	0	1
Increase in credit card debts	.13	(0.3)	0	1
Increase in medical/dental costs	.44	(0.5)	0	1
Increase in necessity costs	.43	(0.5)	0	1
Increase in child education costs	.18	(0.4)	0	1
Delay receiving alimony payments	.08	(0.3)	0	1
Family member changed jobs	.28	(0.5)	0	1
Family member quit or lost job	.21	(0.4)	0	1
Family member retired	.01	(0.1)	0	1
Member started or returned to work	.23	(0.4)	0	1
Member had extended work absence	.19	(0.4)	0	1
Decrease in job satisfaction	.23	(0.4)	0	1
Member had diff w/work colleagues	.16	(0.4)	0	1
Family member promoted	.28	(0.5)	0	1
Moved to new home or apartment	.26	(0.4)	0	1
New school for child	.22	(0.4)	0	1
Parent/spouse became ill/injured	.11	(0.3)	0	1
Child became ill/injured	.20	(0.4)	0	1
Relative/friend became ill/injured	.23	(0.4)	0	1
Member became disabled	.12	(0.3)	0	1
Increase diff managing ill member	.09	(0.3)	0	1
Relative sent to nursing home	.05	(0.2)	0	1
Increase care to parents	.06	(0.2)	0	1
Difficulty arranging child care	.18	(0.4)	0	1
Parent/spouse died	.02	(0.1)	0	1
Child died	.03	(0.2)	0	1
Relative died	.15	(0.4)	0	1
Close friend died	.11	(0.3)	0	1
Married child divorced/separated	.02	(0.1)	0	1
Member ends close relationship	.07	(0.3)	0	1
Family member married	.06	(0.2)	0	1
Young adult member leaves home	.05	(0.2)	0	1
Young adult member begins college	.04	(0.2)	0	1
New person in (back in) house	.08	(0.3)	0	1
Parent/spouse returns to school	.07	(0.3)	0	1
Family member went to jail or JD	.04	(0.2)	0	1
Family member arrested	.05	(0.2)	0	1
Sexual abuse or violence in home	.02	(0.1)	0	1
Family member ran away from home	.02	(0.1)	0	1
Member dropped out of school	.02	(0.1)	0	1

(table continues)

	Mean	(SD)	Minimum	Maximum
Family Inventory of Life Events and Changes				
Non-Events	6.21	(4.5)	0	24
Transitions (Events)	3.63	(2.9)	0	22
Affected Family System				
Respondent	3.48	(3.0)	0	17
Family	5.35	(3.6)	0	22
Children	2.60	(2.2)	0	15
Spouse	1.66	(1.7)	0	9
Parents	1.38	(1.3)	0	9
Friends	0.58	(0.8)	0	4
In-laws	0.18	(0.4)	0	1
Relatives	0.61	(0.9)	0	4
Coworkers	0.16	(0.4)	0	1
Content of Event or Change				
Conflict	2.69	(2.7)	0	14
Separation	1.37	(1.2)	0	6
Illness	0.85	(1.2)	0	6
Sexual Conflict	0.21	(0.5)	0	3
Pregnancy	0.22	(0.5)	0	3
Debt	2.32	(1.9)	0	13
Work Related	1.31	(1.5)	0	6
Finance	4.23	(2.9)	0	21
Death	0.31	(0.6)	0	4
Legal Troubles	0.08	(0.4)	0	2
Total FILE	**10.80**	**(6.7)**	**0**	**51**

Normative data for the PSI are presented in Tables 16 and 17. Stress related to the child was most prominent in the temperament and ability scales. The average of this sample was actually in the 77th percentile of parents reported in the PSI manual (Abidin, 1990) for the child-related stress scale. Additionally, the average of this sample was in the 60th percentile for the restriction of role, social isolation and attachment subscales, the 36th percentile for sense of competence, the 63rd percentile for the spousal relationship and

health subscales, the 56th percentile for depression (guilt for child), the 62nd percentile for parent-related stress, and the 70th percentile for total parenting stress. These computations took into account the difference in number of items and related like constructs.

These comparisons showed that this sample of families with a child with disabilities exhibited higher levels of stress than the normative sample. This is most dramatically seen in the child's temperament and ability, as one would expect.

Normative information for the FACES III is presented in Table 18. Scores on the perceived cohesion scales indicated that the average score of this sample is very similar to the normative sample (Olson et al., 1985). Other scores were not related directly to constructs measured in the manual, and therefore their normative data were not comparable.

Normative data on the FILE are presented in Table 19. The means actually represent the percentage of people who marked the event or change as "yes, it happened." From this it can be seen that the most frequent events and changes, those marked by over 40% of the respondents, were increase in outside child activities, increase in unfinished chores, increase in medical/dental costs, and increase in necessity costs. The least frequent items, those marked only 1 or 2% of the time, were family member retired, family member had an abortion, parent or spouse died, married child divorced or separated, sexual abuse in the home, family member ran away, and family member

dropped out of school. All items were marked by at least 1% of the respondents.

Step 6: Establishing Validity

Validity is discussed in three sections. The first section contains the concurrent validity within measures. The second section contains the concurrent validity across measures. Finally, the third section presents correlations with child and family characteristics.

Concurrent Validity Within Measures

It should be noted that most all of these correlation coefficients were statistically significant. The large sample size provided enough analytic power to eliminate statistical significance as an important consideration.

The Family Support Scale. Table 20 presents correlations between the different scales and total score of the FSS. These correlations were all positive and demonstrated moderate to high correlations between scales. The highest relationship between subscales was with social and spousal support (r = .51). Social support correlated the highest with the FSS total score (r = .85), thus, it best signified the overall construct being measured by the FSS.

The Family Resource Scale. Table 21 provides the correlations between the different scales and the total score of the FRS. These correlations were also all positive and are extremely high. As would be expected, the highest correlation was between the two monetary scales (r = .75). All three subscales of the FRS correlated very

Table 20

Concurrent Validity Correlations among FSS Scales

	Family Support	Spousal Support	Social Support	Pro Support	**Total Support**
Familial Support	1.00				
Spousal Support	.28	1.00			
Social Support	.35	.51	1.00		
Professional Support	.21	.23	.41	1.00	
Total Support	**.56**	**.70**	**.85**	**.68**	**1.00**

Table 21

Concurrent Validity Correlations Among FRS Scales

	Time	Necessities	Extras	**Total Resources**
Time Resources	1.00			
Necessities	.48	1.00		
Extras	.62	.75	1.00	
Total Resources	**.84**	**.78**	**.93**	**1.00**

highly with the FRS total score (r = .84 with time, r = .78 with necessities, and r = .93 with extras).

The Parenting Stress Index. Table 22 shows the correlations between the three subscales of the PSI child-related stress scale and all other subscale and total scores of the PSI. Correlations were all positive; within the subscales of the child-related stress scale, scores were all moderately high. Correlations between child- and parent-related parenting stress showed correlation coefficients ranging from .06 to .44.

Table 22

Concurrent Validity Correlations among PSI Child Scales

	Ability	Temperament	Interact
Child Ability	1.00		
Child Temperament	.52	1.00	
Parent/Child Interaction	.44	.35	1.00
Total Child-Related Stress	**.87**	**.82**	**.64**
Restriction of Role	.44	.39	.24
Attachment	.29	.38	.35
Parent Education	.06	.12	.09
Sense of Competence	.33	.32	.31
Spousal Relationship	.32	.23	.20
Social Isolation	.35	.32	.26
Guilt for Child	.31	.43	.29
Health	.23	.23	.11
Birth Stress	.39	.23	.22
Total Parent-Related Stress	**.50**	**.46**	**.36**
Total Parenting Stress	**.75**	**.70**	**.55**

The highest correlation between stress related to child ability and a parent-related stress score was with the restriction of role scale. This implied a relationship between child ability and a parent's restriction of role. In addition, stress due to child ability correlated between .23 and .39 with all other scales of the PSI parent-related stress scale other than parent education.

Among the parent-related stress subscales, stress due to child temperament related most highly with the guilt for child scale. Temperament related relatively high with every parent-related stress scale except parent education (r = .12). The parent/child interaction scale related most highly with the attachment subscale (r = .35), as one would hope. In addition, parent/child interaction correlated least with health (r = .11) and parent education (r = .09).

Table 23 shows the correlations between the nine subscales of the PSI parent-related stress scale and all other subscale and total scores of the PSI. Except for the parent education subscale, all correlations were positive, moderately high, and ranged from .19 to .54. Correlations with the parent-related total score indicated that restriction of role and social isolation contributed the most to the total, while parent education contributed to and was least correlated to the parent related total (r = .15).

Table 23

Concurrent Validity Correlations among PSI Parent Scales

	RR	AT	ED	SC	SP	SI	GC	HE	BS
Ability	.44	.29	.06	.33	.32	.35	.31	.23	.39
Temperament	.39	.38	.12	.32	.23	.32	.43	.23	.23
Parent/Child Interaction	.24	.35	.09	.31	.20	.26	.29	.11	.22
Total Child-Related Stress	**.47**	**.42**	**.11**	**.40**	**.32**	**.40**	**.43**	**.25**	**.36**
Restriction of Role	1.00								
Attachment	.36	1.00							
Parent Education	.01	.13	1.00						
Sense of Competence	.38	.37	.03	1.00					
Spousal Relationship	.52	.27	.05	.27	1.00				
Social Isolation	.54	.42	.14	.40	.49	1.00			
Guilt for Child	.47	.49	.06	.44	.37	.49	1.00		
Health	.39	.19	.02	.26	.34	.44	.29	1.00	
Birth Stress	.45	.33	-.07	.32	.36	.40	.37	.31	1.00
Total Parent-Related Stress	**.81**	**.61**	**.15**	**.59**	**.70**	**.79**	**.69**	**.55**	**.62**
Total Parenting Stress	**.74**	**.59**	**.15**	**.57**	**.60**	**.69**	**.65**	**.47**	**.57**

Table 24 shows the correlations among the higher order scales and the PSI total score. Despite the fact that these items factored into two separate scales, and the fact that there was no item overlap, the two higher order scales correlated very high (r = .57). Correlations with the total score show that the total PSI was equally represented by the two higher order scales.

Table 24

Concurrent Validity Correlations among PSI Total Scales

	Child	Parent	Total
Total Child Related Stress	1.00		
Total Parent Related Stress	.57	1.00	
Total Parenting Stress	.86	.91	1.00

The Family Adaptability and Cohesion Evaluation Scales. Table 25 presents the correlations among scales of the FACES III. As would be expected, the highest correlation was between perceived and ideal cohesion (r = .56). Child empowerment was the only adaptability scale that correlated well with the other scales. In general, the adaptability scales were inconsistent in their relationships with the other scales of the FACES III.

Table 25

Concurrent Validity Correlations among FACES III Scales

	Perceived Cohesion	Ideal Cohesion	Child Empower.	Family Leader.	Change
Perceived Cohesion	1.00				
Ideal Cohesion	.56	1.00			
Child Empowerment	.25	.26	1.00		
Family Leadership	.00	-.12	.15	1.00	
Change	.07	.17	.37	.29	1.00

The Family Inventory of Life Events and Changes. Tables 26 through 28 present correlations between the various life events scales. Table 26 presents correlations with the events and non-events scales. The correlation between these two nonoverlapping scales was

Table 26

Concurrent Validity Correlations among FILE Events Scales

	Non-Events	Events
Non-Events	1.00	
Transitions (Events)	.38	1.00
Respondent	.89	.44
Family	.76	.73
Children	.79	.39
Spouse	.65	.48
Parents	.58	.49
Friends	.44	.50
In-laws	.34	.17
Relatives	.33	.43
Coworkers	.38	.15
Conflict	.89	.31
Separation	.55	.35
Illness	.36	.54
Sexual Conflict	.46	.24
Pregnancy	.11	.41
Debt	.62	.47
Work Related	.39	.57
Finance	.63	.60
Death	.09	.42
Legal Troubles	.17	.30
Total FILE	**.89**	**.74**

Table 27

Concurrent Validity Correlations among FILE Family System Scales

	Res	Fam	Chi	Spo	Par	Fri	InL	Rel	CoW
Non-Events	.89	.76	.79	.65	.58	.44	.34	.33	.38
Transitions	.44	.73	.39	.48	.49	.50	.17	.43	.15
Respondent	1.00								
Family	.68	1.00							
Children	.72	.52	1.00						
Spouse	.68	.52	.44	1.00					
Parents	.53	.46	.46	.80	1.00				
Friends	.42	.46	.36	.26	.29	1.00			
In-laws	.39	.25	.17	.19	.14	.17	1.00		
Relatives	.34	.33	.20	.20	.35	.59	.53	1.00	
Coworkers	.29	.38	.16	.20	.18	.14	.12	.14	1.00
Conflict	.90	.60	.77	.57	.47	.43	.39	.33	.23
Separation	.47	.38	.50	.72	.71	.26	.09	.12	.16
Illness	.36	.45	.31	.30	.33	.47	.15	.54	.10
Sexual Conflict	.55	.36	.29	.59	.35	.20	.16	.15	.14
Pregnancy	.18	.26	.11	.29	.13	.14	.10	.08	.01
Debt	.56	.76	.43	.41	.36	.25	.18	.19	.27
Work Related	.35	.65	.20	.31	.28	.14	.13	.13	.51
Finance	.56	.86	.40	.42	.38	.27	.18	.21	.44
Death	.10	.15	.12	.09	.30	.51	.04	.52	.02
Legal Troubles	.19	.31	.18	.15	.16	.11	.08	.10	.03
Total FILE	**.86**	**.91**	**.74**	**.70**	**.65**	**.53**	**.32**	**.43**	**.35**

Table 28

Concurrent Validity Correlations among FILE Item Content Scales

	Con	Sep	Ill	Sex	Prg	Dbt	Wrk	Fin	Dth	Lgl
Non-Events	.89	.55	.36	.46	.11	.62	.39	.63	.09	.17
Transitions	.31	.35	.54	.24	.41	.47	.57	.60	.42	.30
Respondent	.90	.47	.36	.55	.18	.56	.35	.56	.10	.19
Family	.60	.38	.45	.36	.26	.76	.65	.86	.15	.31
Children	.77	.50	.31	.52	.29	.11	.43	.40	.12	.18
Spouse	.57	.72	.30	.59	.29	.41	.31	.42	.09	.15
Parents	.47	.71	.33	.35	.13	.36	.28	.38	.30	.16
Friends	.43	.26	.47	.20	.14	.25	.14	.27	.51	.11
In-laws	.39	.09	.15	.16	.10	.18	.13	.18	.04	.08
Relatives	.33	.12	.54	.15	.08	.19	.13	.21	.52	.10
Coworkers	.23	.16	.10	.14	.01	.27	.51	.44	.02	.03
Conflict	1.00									
Separation	.36	1.00								
Illness	.31	.13	1.00							
Sex Conflict	.52	.26	.17	1.00						
Pregnancy	.13	.06	.13	.14	1.00					
Debt	.40	.34	.26	.24	.12	1.00				
Work Related	.23	.26	.13	.17	.06	.54	1.00			
Finance	.38	.36	.26	.23	.10	.86	.75	1.00		
Death	.06	.07	.26	.03	.09	.08	.03	.10	1.00	
Legal Troubles	.17	.13	.16	.11	.09	.14	.12	.14	.06	1.00
Total FILE	**.77**	**.56**	**.50**	**.46**	**.27**	**.71**	**.55**	**.78**	**.25**	**.29**

.38. This indicated a moderate relationship between single events and increases and decreases in family stressors. In addition, the non-events scale was best described by its relationship to the respondent, family, and children, and the conflict scales. Thus, these change items mostly represented conflict in which the respondent and her/his immediate family were directly involved. Correlations with the events scale were lower than those for the non-events scale, but mostly described family financial matters.

Table 27 emphasizes correlations with the family systems scales. Once again, the respondent and the child items were most directly related to non-event and conflict. Family items were most directly related to debt and finance. Spouse and parent items were highly correlated, but this was the by-product of item wording. For many of these items, spouse and parents were not separated on the item, so there was a great deal of overlap on these two scales. The friends and relatives items were mostly related to illness and death, and as would be expected, the coworkers items were work related. Many of these relationships were caused by item overlap, that is, some items are counted on many scales. The fact that these scales share items causes the inflated correlations.

Table 28 shows FILE correlations with the columns being item contents. Again, these correlations were confounded enough that conclusions about their relationships are improper.

Concurrent Validity Across Measures

Table 29 shows the relationship between the FSS and the FRS. Correlations were all positive and moderate, and ranged from .06 to .30. Spousal support related the highest with resources, indicating the fact that intact spousal relationships implied better resources. This was not unexpected. Each of the resource scales correlated similarly to support, and overall the two measures correlated at .29.

Table 29

Concurrent Validity Correlations Between FSS and FRS

	Family Support	Spousal Support	Social Support	Pro Support	**Total Support**
Time Resources	.17	.25	.25	.08	**.26**
Necessities	.11	.23	.17	.06	**.20**
Extras	.13	.28	.25	.08	**.26**
Total Resources	**.16**	**.30**	**.27**	**.09**	**.29**

Table 30 presents the relationship between the FSS and the PSI. All but three of these correlations were negative, and indicated minor relationships. This negative relationship indicated that increase in support was mildly related to a decrease in stress. Family and spousal support was moderately related to social isolation (r = -.21 and -.25, respectively). As would be expected, spousal support was related to spousal relationship (r = -.38) and social support was related to social isolation (r = -.29). Professional support was not related strongly to any scale of the PSI. As for the child-related stress scales, stress due to child temperament related the highest

Table 30

Concurrent Validity Correlations Between FSS and PSI

	Family Support	Spousal Support	Social Support	Pro Support	**Total Support**
Ability	-.03	-.14	-.11	.07	**-.08**
Temperament	-.12	-.20	-.18	-.07	**-.20**
Interaction	-.06	-.09	-.10	-.09	**-.12**
Total Child Stress	**-.08**	**-.19**	**-.17**	**-.02**	**-.16**
Rest of Role	-.12	-.12	-.16	-.01	**-.15**
Attachment	-.10	-.17	-.17	-.16	**-.22**
Parent Education	.04	-.16	-.23	-.04	**-.16**
Sense of Comp	-.09	-.12	-.15	-.09	**-.16**
Spousal Relation	-.06	-.38	-.21	-.08	**-.26**
Social Isolation	-.21	-.25	-.29	-.14	**-.31**
Guilt for Child	-.08	-.10	-.13	-.10	**-.15**
Health	-.11	-.08	-.08	-.01	**-.09**
Birth Stress	-.04	-.06	-.03	.04	**-.03**
Total Parent Stress	**-.15**	**-.26**	**-.25**	**-.10**	**-.27**
Total PSI	**-.14**	**-.26**	**-.24**	**-.07**	**-.25**

with the FSS. Overall, the two measures total scores correlated moderately (r = -.25) with the FSS correlating most highly with parent-related stress (r = -.27) and the PSI relatingmost highly with spousal and social support (r = -.26 and -.25, respectively).

Table 31 shows the correlations between the FSS and the FACES III. These correlations were all relatively small. The notable

Table 31

Concurrent Validity Correlations Between FSS and FACES III

	Family Support	Spousal Support	Social Support	Pro Support	**Total Support**
Perceived Cohesion	.07	.27	.21	.11	**.24**
Ideal Cohesion	-.03	.15	.08	.07	**.11**
Child Empowerment	.00	.06	.15	.06	**.11**
Family Leadership	-.01	.10	.10	.05	**.10**
Change	.06	.09	.12	.08	**.13**

exception being the correlation between perceived cohesion and spousal and social support (r = .27 and .21, respectively). Thus, more spousal and social support related to more perceived family cohesion. The low correlation with family support was probably because the FACES III asked about the respondent's current family (spouse and children), whereas the family support scale items were the respondent's parents and other relatives.

Table 32 presents the correlations between the FSS and the FILE. In general these correlations were nearly zero. The notable, and sensible, exceptions were the spousal and separation scales of the FILE and spousal support (r = -.24 and -.20, respectively). The overall correlation between the two measures was -.04.

Table 33 shows the correlations between the FRS and the PSI. All of these correlations were negative. Thus, higher levels of resources related to lower stress levels. Time resources correlated the most with the PSI in general, and very high with parent-related stress (r = -.51) specifically. Within the second-order scales, time

Table 32

Concurrent Validity Correlations Between FSS and FILE

	Family Support	Spousal Support	Social Support	Pro Support	**Total Support**
Non-Events	-.07	-.15	-.05	.02	**-.08**
Transitions	.11	-.05	.00	.06	**.04**
Respondent	-.04	-.20	-.09	.02	**-.10**
Family	.04	-.06	-.02	.03	**-.01**
Children	-.05	-.12	-.02	.05	**-.04**
Spouse	-.01	-.24	-.06	-.02	**-.11**
Parents	-.04	-.19	-.04	.01	**-.08**
Friends	.06	-.10	.03	.09	**.03**
In-laws	-.05	-.10	-.08	.02	**-.08**
Relatives	.01	-.03	-.03	.09	**.01**
Coworkers	.02	-.02	-.03	-.04	**-.03**
Conflict	-.09	-.19	-.09	.01	**-.11**
Separation	.03	-.20	.01	.02	**-.04**
Illness	.06	-.01	.04	.10	**.06**
Sex Conflict	.00	-.15	-.10	-.06	**-.10**
Pregnancy	.10	-.05	-.01	.03	**.01**
Debt	.00	-.05	-.01	-.01	**-.02**
Work Related	.07	.02	-.03	-.02	**.01**
Finance	.03	-.01	-.03	-.01	**-.01**
Death	.07	-.01	.05	.08	**.07**
Legal Troubles	.00	-.07	-.02	.06	**-.02**
Total FILE	**.00**	**-.13**	**-.04**	**.04**	**-.04**

Table 33

Concurrent Validity Correlations Between FRS and PSI

	Time	Necessities	Extras	**Total Resources**
Ability	-.29	-.16	-.21	**-.26**
Temperament	-.23	-.17	-.18	**-.22**
Interaction	-.15	-.14	-.12	**-.15**
Total Child Stress	**-.30**	**-.20**	**-.22**	**-.28**
Rest of Role	-.45	-.18	-.26	**-.36**
Attachment	-.19	-.23	-.18	**-.21**
Parent Education	-.03	-.29	-.33	**-.25**
Sense of Comp	-.28	-.20	-.19	**-.25**
Spousal Relation	-.43	-.18	-.29	**-.36**
Social Isolation	-.44	-.28	-.35	**-.42**
Guilt for Child	-.25	-.20	-.19	**-.24**
Health	-.34	-.17	-.23	**-.30**
Birth Stress	-.28	-.12	-.12	**-.20**
Total Parent Stress	**-.51**	**-.30**	**-.37**	**-.46**
Total PSI	**-.47**	**-.29**	**-.34**	**-.43**

resources correlated most with child ability (r = -.29), parents' restriction of role (r = -.45), spousal relationship (r = -.43), social isolation (r = -.44), and health (r = -.34). The only low correlation with time resources was with stress related to parent education.

The monetary resources scales of the FRS correlated most with the PSI parent education subscale (r = -.29 for necessities and r = -.33 for extras), and the social isolation subscale (r = -.28 for necessities and r = -.35 for extras). All other correlations were between -.12 and -.29. Overall, the two measures correlated at -.43 with resources correlating most with parent-related stress (r = -.46), and the PSI total relating most with time resources (r = -.47).

Table 34 presents correlations between the FRS and the FACES III. The relationship between all three of the adaptability scales and the FRS was basically zero. Perceived cohesion did correlate positively with all of the FRS scales (correlations ranged from .32 to .35 for the subscales and .39 with the FRS total). This indicated that more family cohesion was related to more resources.

Table 34

Concurrent Validity Correlations Between FRS and FACES III

	Time	Necessities	Extras	**Total Resources**
Perceived Cohesion	.34	.32	.35	**.39**
Ideal Cohesion	.05	.22	.13	**.13**
Child Empowerment	.05	.09	.08	**.09**
Family Leadership	-.04	.03	-.02	**-.02**
Change	-.07	-.05	-.09	**-.09**

Table 35 presents correlations between the FRS and the FILE. These correlations were, with the exception of the death items of the FILE, all negative. This indicated that more life events and changes

Table 35

Concurrent Validity Correlations Between FRS and FILE

	Time	Necessities	Extras	**Total Resources**
Non-Events	-.49	-.22	-.34	**-.43**
Transitions	-.13	-.11	-.19	**-.18**
Respondent	-.46	-.25	-.34	**-.42**
Family	-.37	-.20	-.32	**-.37**
Children	-.34	-.15	-.22	**-.29**
Spouse	-.31	-.19	-.28	**-.31**
Parents	-.23	-.11	-.19	**-.21**
Friends	-.16	-.07	-.15	**-.16**
In-laws	-.23	-.12	-.18	**-.21**
Relatives	-.12	-.02	-.10	**-.11**
Coworkers	-.16	-.03	-.05	**-.10**
Conflict	-.46	-.22	-.30	**-.39**
Separation	-.21	-.10	-.18	**-.20**
Illness	-.15	-.08	-.15	**-.15**
Sex Conflict	-.23	-.13	-.16	**-.21**
Pregnancy	-.06	-.13	-.12	**-.11**
Debt	-.32	-.24	-.40	**-.39**
Work Related	-.16	-.08	-.15	**-.16**
Finance	-.28	-.14	-.27	**-.29**
Death	.04	.03	.01	**.03**
Legal Troubles	-.09	-.13	-.12	**-.13**
Total FILE	**-.41**	**-.21**	**-.34**	**-.39**

were related to less time and monetary resources. Time resources were most highly related to non-events (r = -.49), items related to the respondent (r = -.46), and conflict (r = -.46). The monetary resources, specifically resources for extras, were most highly related to debt (r = -.40), finance (r = -.27), family (r = -.32), spouse (r = -.28), and conflict (r = -.30). In addition, resources for extras related to the non-events and respondent scales (r = -.34 for both). Correlations with the necessities scale were similar in pattern, but lower in magnitude. Overall, the two measures correlated at -.39 with the FILE scales listed above as the greatest predictors of resources for both time and money.

Table 36 shows the correlations between the FACES III and the PSI. With few exceptions, the cohesion scales of the FACES III correlated negatively with the PSI. This indicated that more cohesion, mostly perceived cohesion, related to less stress. Perceived cohesion related most highly with spousal relationship (r = -31), social isolation (r = -.28), attachment (r = -.25), parent education (r = -.26), and parent/child interaction (r = -.20). Correlations were even higher between the FACES III and the PSI total score (r = -.30), and more specifically parent-related stress (r = -.32). With few exceptions, the PSI did not correlate with any other scale of the FACES III.

Table 36

Concurrent Validity Correlations Between FACES III and PSI

	Per Co	Id Co	Ch Emp	Fam Lead	Change
Ability	-.17	-.03	-.01	.02	.07
Temperament	-.12	-.04	-.02	-.01	.03
Interaction	-.20	-.13	-.03	.04	.01
Total Child Stress	**-.19**	**-.06**	**-.02**	**.02**	**.05**
Rest of Role	-.14	.04	-.04	-.01	.09
Attachment	-.25	-.24	-.06	.01	.01
Parent Education	-.26	-.23	-.17	-.08	-.08
Sense of Comp	-.22	-.07	-.02	.01	.06
Spousal Relation	-.31	-.08	-.13	-.05	.00
Social Isolation	-.28	-.09	-.14	-.02	.03
Guilt for Child	-.17	-.04	-.04	.04	.08
Health	-.14	.02	-.04	.02	.08
Birth Stress	-.16	-.07	-.02	.09	.03
Total Parent Stress	**-.32**	**-.10**	**-.11**	**.00**	**.06**
Total PSI	**-.30**	**-.10**	**-.08**	**.01**	**.07**

Table 37 presents the correlations between the FACES III and the FILE. In general, these two measures failed to correlate. Perceived cohesion and change correlated the strongest with the FILE. The former of these correlated negatively with the FILE, that is, more perceived cohesion related to fewer life events and changes, and the latter correlated positively, that is, more change (rules and

Table 37

Concurrent Validity Correlations Between FACES III and FILE

	Per Co	Id Co	Ch Emp	Fam Lead	Change
Non-Events	-.17	.07	.09	.00	.16
Transitions	-.08	.04	.05	.01	.11
Respondent	-.21	.02	.04	.02	.15
Family	-.14	.06	.07	.04	.16
Children	-.12	.03	.11	-.06	.11
Spouse	-.14	.01	.04	.02	.11
Parents	-.10	-.01	.07	.02	.09
Friends	-.12	.01	.06	-.04	.08
In-laws	-.13	.01	-.07	.02	.08
Relatives	-.06	.10	-.01	.01	.08
Coworkers	-.01	.05	.03	.07	.05
Conflict	-.23	.00	.04	-.01	.13
Separation	-.03	.05	.12	.00	.06
Illness	-.04	.07	.04	.01	.09
Sex Conflict	-.19	-.03	.01	.03	.08
Pregnancy	-.12	-.10	-.02	.01	.11
Debt	-.13	.03	.05	.01	.16
Work Related	.00	.08	.03	.06	.06
Finance	-.05	.11	.06	.03	.13
Death	-.01	.01	.01	.00	.03
Legal Troubles	-.10	-.02	-.02	.00	.06
Total FILE	**-.16**	**.07**	**.09**	**.02**	**.17**

responsibilities) related to more life events and changes (increase in stressors). The magnitudes of these correlations, however, were very small.

Table 38 shows correlations between the PSI child-related stress scales and the FILE. Again, these measures failed to correlate. In general, correlations were positive. Thus, more life events related

Table 38

Concurrent Validity Correlations Between PSI Child Scales and FILE

	Ability	Temperament	Interact
Non-Events	.24	.19	.12
Transitions	.05	-.01	.05
Respondent	.24	.19	.14
Family	.17	.08	.10
Children	.22	.19	.11
Spouse	.07	.08	.02
Parents	.05	.10	.01
Friends	.07	.04	.05
In-laws	.15	.13	.04
Relatives	.07	.06	.01
Coworkers	.03	.05	.05
Conflict	.25	.20	.13
Separation	.02	.08	-.05
Illness	.14	-.05	.08
Sex Conflict	.05	.05	.05
Pregnancy	.02	-.03	.09
Debt	.14	.09	.09
Work Related	.02	.02	.01
Finance	.10	.07	.05
Death	.02	-.01	.03
Legal Troubles	.05	.08	.09
Total FILE	**.19**	**.13**	**.11**

to higher levels of stress related to the respondent's child. Highest correlations were between stress related to child ability and non-events (r = .24), children (r = .22), conflict (r = .25), and the respondent (r = .24). The FILE total correlated most highly with stress related to child ability (r = .19). The other two subscales of the PSI correlated similarly with the FILE but at smaller magnitudes.

Table 39 shows the correlations between the PSI parent-related stress scales and the FILE. All of the strong relationships were positive. That is, more stress correlated with more life events and changes. The highest correlations were between the restriction of role, the social isolation, the spousal relationship, and the health subscales of the PSI, and the non-events, the conflict, and the respondent scales of the FILE.

Table 39

Concurrent Validity Correlations Between PSI Parent Scales and FILE

	RR	AT	ED	SC	SP	SI	GC	HE	BS
Non-Events	.38	.15	-.05	.28	.39	.34	.28	.34	.26
Transitions	.06	-.03	.09	.06	.09	.08	.02	.11	.00
Respondent	.36	.16	.01	.27	.41	.35	.26	.30	.21
Family	.23	.05	-.01	.17	.24	.23	.16	.25	.19
Children	.30	.14	-.03	.24	.26	.23	.21	.22	.14
Spouse	.18	.08	.06	.12	.34	.24	.13	.25	.12
Parents	.14	.09	.08	.11	.21	.14	.12	.19	.06
Friends	.14	.04	.06	.10	.20	.11	.06	.15	.12
In-laws	.19	.05	.10	.12	.18	.28	.15	.12	.11
Relatives	.12	-.01	.07	.05	.11	.10	.09	.11	.05
Co-workers	.07	.01	-.06	.11	.07	.07	.08	.08	.08
Conflict	.38	.17	-.01	.29	.42	.37	.27	.33	.23
Separation	.10	.06	.04	.07	.19	.11	.11	.11	.07
Illness	.11	-.03	-.02	.01	.11	.03	.00	.18	.08
Sex Conflict	.14	.07	.06	.09	.27	.20	.10	.18	.05
Pregnancy	.04	.07	.10	.06	.09	.13	.02	.10	.03
Debt	.20	.07	.01	.15	.17	.18	.16	.19	.13
Work Related	.05	-.01	-.04	.09	.08	.09	.06	.07	.03
Finance	.18	.02	-.05	.14	.14	.16	.14	.17	.12
Death	.01	-.03	.06	-.01	.01	.00	-.02	-.01	-.03
Legal Troubles	.05	.07	.10	.05	.01	.08	.03	.07	.04
Total FILE	**.30**	**.10**	**.01**	**.22**	**.32**	**.28**	**.21**	**.29**	**.19**

Table 40 presents the correlations between the PSI totals and the FILE. The PSI total scores were again most highly related to the non-events (r = .40), the children (r = .32), the conflict (r = .41), and the respondent (r = .40) scales of the FILE. The parent-related stress scores were more strongly related to these FILE scales than either the child-related scale or the PSI total.

Table 40

Concurrent Validity Correlations Between PSI Total Scores and FILE

	PSI Child	PSI Parent	PSI Total
Non-Events	.24	.44	.40
Transitions	.04	.08	.07
Respondent	.25	.43	.40
Family	.15	.28	.25
Children	.23	.32	.32
Spouse	.08	.28	.21
Parents	.08	.20	.16
Friends	.07	.18	.15
In-laws	.15	.24	.22
Relatives	.07	.12	.11
Co-workers	.05	.09	.08
Conflict	.25	.46	.41
Separation	.03	.15	.11
Illness	.07	.09	.09
Sex Conflict	.07	.21	.17
Pregnancy	.02	.11	.07
Debt	.14	.23	.22
Work Related	.02	.08	.06
Finance	.10	.19	.17
Death	.01	.00	.00
Legal Troubles	.09	.08	.09
Total FILE	**.19**	**.35**	**.32**

Overall, these tables present concurrent validity evidence that the measures do correlate at a variety of levels without duplicating effort. In addition, correlations were in the expected directions, and in individual cases where certain relationships were obvious by definition, no surprises arose.

Correlations with Child and Family Characteristics

Tables 41 through 47 present correlations between each family measure and a variety of demographic variables. These variables are presented in two sections: child variables and family variables. Child ethnicity was coded as a dichotomy, with Caucasian being 1, and non-Caucasian being 0. Child gender was also coded as a dichotomy, with male being 1 and female being 0.

Family variables provided data on mothers and fathers specifically, and size and composition of the family in general. Education variables were coded in years of education received. Occupation variables were coded into four categories: unemployed, blue collar, technical or managerial, and professional. Marital status was coded as a dichotomy, with married being 1 and single, separated, divorced, and widowed being 0. Family income was partitioned into 11 categories and treated as continuous, and family intactness was a dichotomy, with both natural parents in the home considered intact.

The Family Support Scale. Correlations between the FSS and the family demographic variables are presented in Table 41. Familial support correlated most with variables that indicated the age of the family: child age (r = -.13), maternal age (r = -.17), paternal age

Table 41

Concurrent Validity Correlations for the FSS with Demographic Variables

	Family Support	Spousal Support	Social Support	Pro Support	**Total Support**
Child Variables					
Child Gender	.03	.00	-.01	.04	**.02**
Child Age	-.13	-.06	-.06	-.05	**-.09**
Ethnicity	-.10	.16	.02	-.02	**.03**
Birth Order	-.13	-.02	-.02	-.07	**-.07**
Family Variables					
Maternal Age	-.17	.03	.06	-.02	**-.01**
Maternal Education	.03	.16	.25	.02	**.18**
Maternal Occupation	.06	.07	.12	.01	**.09**
Maternal Work Hours	.07	.03	.10	-.03	**.07**
Maternal Marital Status	-.07	.43	.08	-.02	**.15**
Paternal Age	-.16	.00	.08	-.01	**-.01**
Paternal Education	.01	.20	.24	.04	**.19**
Paternal Occupation	-.03	.12	.20	.02	**.13**
Paternal Work Hours	-.01	.06	.06	-.03	**.04**
Family income	-.03	.30	.21	.01	**.19**
Family Intactness	-.10	.41	.07	-.03	**.13**
# of Adults in Home	.05	.10	-.06	-.06	**.00**
# of Children in Home	-.14	-.03	-.06	-.03	**-.10**

Table 42

Concurrent Validity Correlations for the FRS with Demographic Variables

	Time	Necess	Extras	**Total Resources**
Child Variables				
Child Gender	.09	.05	.06	**.08**
Child Age	-.03	.02	.01	**.00**
Ethnicity	-.03	.28	.17	**.13**
Birth Order	-.09	-.12	-.10	**-.11**
Family Variables				
Maternal Age	-.02	.11	.14	**.09**
Maternal Education	.00	.26	.30	**.21**
Maternal Occupation	-.01	.15	.18	**.12**
Maternal Work Hours	-.04	.06	.06	**.03**
Maternal Marital Status	-.01	.25	.21	**.15**
Paternal Age	-.02	.11	.14	**.09**
Paternal Education	.06	.29	.36	**.27**
Paternal Occupation	.08	.28	.35	**.27**
Paternal Work Hours	.02	.21	.25	**.18**
Family Income	.04	.42	.48	**.36**
Family Intactness	.00	.23	.20	**.15**
# of Adults in Home	.06	.09	.07	**.07**
# of Children in Home	-.14	-.13	-.13	**-.14**

Table 43

Concurrent Validity Correlations for the PSI Child Scales with Demographic Variables

	Ability	Temperament	Interact
Child Variables			
Child Gender	-.02	-.08	-.01
Child Age	.00	.18	-.04
Ethnicity	-.04	-.05	-.09
Birth Order	-.03	-.06	-.01
Family Variables			
Maternal Age	-.05	-.07	-.07
Maternal Education	-.04	-.11	-.11
Maternal Occupation	-.03	-.05	-.09
Maternal Work Hours	-.04	.06	-.06
Maternal Marital Status	-.06	-.14	-.05
Paternal Age	-.02	-.06	-.08
Paternal Education	-.06	-.13	-.10
Paternal Occupation	-.05	-.11	-.11
Paternal Work Hours	-.04	-.04	-.06
Family Income	-.05	-.12	-.12
Family Intactness	-.05	-.08	-.04
# of Adults in Home	-.03	-.07	.02
# of Children in Home	-.03	-.01	.01

Table 44

Concurrent Validity Correlations for the PSI Parent Scales with Demographic Variables

	RR	AT	ED	SC	SP	SI	GC	HE	BS
Child Variables									
Child Gender	-.04	-.05	.04	-.04	-.05	-.04	-.11	-.08	-.02
Child Age	.02	.06	-.11	.16	.01	-.01	.14	-.01	-.04
Ethnicity	.08	-.16	-.22	.07	-.05	.00	.04	.08	.00
Birth Order	.04	.03	-.04	.05	-.09	.00	-.03	.05	-.08
Family Variables									
Maternal Age	-.03	-.01	-.39	.04	-.06	-.08	-.04	.01	.00
Maternal Education	-.01	-.10	-.76	-.04	.00	-.12	-.03	-.02	.09
Maternal Occupation	-.03	-.11	-.32	-.05	-.02	-.07	-.07	-.01	.02
Maternal Wk Hrs	-.13	-.02	-.12	-.03	.02	-.03	-.02	.01	-.05
Maternal Marital Status	.07	-.11	-.26	-.02	-.20	-.01	.01	.05	-.02
Paternal Age	-.01	-.02	-.36	.05	-.04	-.08	-.07	-.01	-.02
Paternal Education	-.03	-.11	-.78	-.04	-.04	-.06	.01	-.06	-.20
Paternal Occupation	-.04	-.11	-.58	-.03	-.10	-.17	-.06	-.02	.03
Paternal Wk Hrs	.01	-.06	-.20	.03	.03	-.05	.05	.05	.06
Family Income	-.01	-.16	-.59	-.03	-.13	-.19	-.05	.00	.06
Family Intact	.07	-.09	-.21	.02	-.22	-.01	.02	.04	-.02
# of Adults in Home	-.05	-.05	.04	-.05	-.12	-.06	-.02	-.09	-.04
# of Children in Home	.08	.06	.01	.09	-.05	.03	.01	.02	-.10

Table 45

Concurrent Validity Correlations for the PSI Totals with Demographic Variables

	PSI Child	PSI Parent	PSI Total
Child Variables			
Child Gender	-.05	-.07	-.07
Child Age	.08	.04	.06
Ethnicity	-.07	.00	-.04
Birth Order	-.05	-.01	-.03
Family Variables			
Maternal Age	-.08	-.07	-.08
Maternal Education	-.10	-.10	-.12
Maternal Occupation	-.07	-.09	-.09
Maternal Work Hours	-.01	-.07	-.05
Maternal Marital Status	-.11	-.06	-.09
Paternal Age	-.06	-.07	-.07
Paternal Education	-.12	-.15	-.15
Paternal Occupation	-.11	-.15	-.15
Paternal Work Hours	-.06	.00	-.03
Family Income	-.11	-.15	-.15
Family Intactness	-.07	-.05	-.07
# of Adults in Home	-.04	-.08	-.07
# of Children in Home	-.02	.03	.01

Table 46

Concurrent Validity Correlations for the FACES III with Demographic Variables

	Per Co	Id Co	Ch Emp	Fam Lead	Change
Child Variables					
Child Gender	.01	-.08	-.02	.01	-.04
Child Age	.05	.06	.13	-.04	-.01
Ethnicity	.19	.26	.15	.04	.02
Birth Order	-.01	.02	.22	-.10	.15
Family Variables					
Maternal Age	.07	.06	.14	-.03	.00
Maternal Education	.23	.17	.15	.12	.05
Maternal Occupation	.11	.09	.05	.02	-.02
Maternal Work Hours	.04	.04	-.01	.01	.02
Maternal Marital Status	.26	.26	.08	.07	.02
Paternal Age	.06	.07	.14	.00	-.01
Paternal Education	.25	.21	.19	.05	.06
Paternal Occupation	.20	.17	.17	.09	.02
Paternal Work Hours	.11	.11	.01	.05	-.07
Family Income	.27	.23	.17	.11	.04
Family Intactness	.22	.22	.08	.11	-.03
# of Adults in Home	.02	.03	.04	.04	.05
# of Children in Home	-.01	.06	.20	-.12	.11

Table 47

Concurrent Validity Correlations for the FILE with Demographic Variables

	Non-Events	Events	FILE Total
Child Variables			
Child Gender	-.08	-.02	**-.07**
Child Age	.09	-.18	**-.02**
Ethnicity	.11	-.04	**.06**
Birth Order	.10	-.06	**.04**
Family Variables			
Maternal Age	.05	-.15	**-.04**
Maternal Education	.07	-.07	**.02**
Maternal Occupation	.05	-.05	**.02**
Maternal Work Hours	.12	.05	**.12**
Maternal Marital Status	-.02	-.11	**-.07**
Paternal Age	.04	-.15	**-.05**
Paternal Education	.03	-.09	**-.02**
Paternal Occupation	.03	-.11	**-.04**
Paternal Work Hours	.05	-.16	**-.05**
Family Income	.03	-.17	**-.06**
Family Intactness	-.04	-.14	**-.10**
# of Adults in Home	-.04	.08	**.01**
# of Children in Home	.11	-.06	**.04**

(table continues)

	Res	Fam	Chi	Spo	Par	Fri	InL	Rel	CoW
Child Variables									
Child Gender	-.08	-.06	-.04	-.06	-.05	-.02	-.02	-.06	-.02
Child Age	.00	-.07	.12	-.04	.04	-.04	-.03	-.01	.05
Ethnicity	.02	.08	.06	.00	.02	-.06	.05	.07	.08
Birth Order	.04	-.02	.21	-.02	.00	.03	-.06	-.07	-.03
Family Variables									
Maternal Age	-.02	-.04	.10	-.11	-.08	-.04	-.15	-.08	.02
Maternal Education	.01	.05	.02	-.03	-.03	-.10	-.06	-.05	.08
Maternal Occupation	.05	.03	.00	-.01	-.03	-.04	.01	.00	.11
Maternal Work Hours	.12	.12	.04	.13	.14	-.05	-.02	.00	.18
Maternal Marital Status	-.15	.02	-.07	-.25	-.18	-.11	-.02	.03	.06
Paternal Age	-.03	-.05	.07	-.09	-.07	.00	-.14	-.08	.02
Paternal Education	-.03	.00	.01	-.07	-.06	-.06	-.08	-.04	.05
Paternal Occupation	-.04	-.03	.03	-.08	-.09	-.04	-.08	-.06	.06
Paternal Work Hours	-.03	-.04	-.03	-.03	-.03	-.03	.00	-.02	.10
Family Income	-.07	-.05	.01	-.16	-.10	-.08	-.05	.01	.08
Family Intactness	-.16	-.02	-.07	-.28	-.19	-.13	-.04	.00	.07
# of Adults in Home	-.06	.02	.01	-.05	.01	-.02	.01	.02	.01
# of Children in Home	.06	-.02	.23	-.04	-.01	.01	-.02	-.03	-.03

(table continues)

	Con	Sep	Ill	Sex	Prg	Dbt	Wrk	Fin	Dth	Lgl
Child Variables										
Child Gender	-.08	-.01	-.02	-.07	-.05	-.04	-.02	-.04	-.01	-.02
Child Age	.04	.09	-.09	-.03	-.30	-.01	-.04	.01	-.07	.00
Ethnicity	.07	.02	.04	.03	-.21	.03	.10	.09	-.12	.01
Birth Order	.12	.02	.00	-.01	.00	.03	-.09	-.04	-.03	-.01
Family Variables										
Maternal Age	.04	-.09	.00	-.03	-.18	.01	-.07	-.02	-.05	-.07
Maternal Education	.01	-.01	.04	-.03	-.12	.02	.07	.08	-.07	-.07
Maternal Occupation	.03	-.02	.02	.02	-.09	.02	.07	.06	-.03	-.05
Maternal Work Hours	.05	.14	.00	.06	-.10	.07	.20	.17	-.01	.02
Maternal Marital Status	-.06	-.24	.02	-.07	-.21	.00	.07	.07	-.05	-.10
Paternal Age	.04	-.06	.00	-.01	-.15	-.01	-.06	-.04	-.07	-.09
Paternal Education	-.03	.01	.01	-.06	-.11	-.04	.04	.05	-.04	-.07
Paternal Occupation	-.01	.00	-.02	-.07	-.07	-.06	-.02	.01	-.08	-.09
Paternal Work Hours	.00	.03	-.07	-.06	-.08	-.07	-.03	.00	-.10	-.16
Family Income	.00	-.11	.02	-.09	-.16	-.10	-.03	-.02	-.08	-.16
Family Intactness	-.08	-.25	-.02	-.12	-.25	-.03	.07	.05	-.06	-.07
# of Adults in Home	-.06	-.05	-.01	-.04	.07	.02	.06	.05	.05	-.09
# of Children in Home	.13	.02	-.02	-.02	.01	.01	-.10	-.05	-.06	.01

($\underline{r}$ = -.16), number of children in the family ($\underline{r}$ = -.14), and birth order ($\underline{r}$ = -.13). These negative correlations indicated that the older the family, the less the perceived, or even needed, support from parents and other relatives.

Spousal support related best to economic as well as marital status variables. The economic variables most related to spousal support were maternal education (r = .16), paternal education (r = .20), and family income (r = .30). The aforementioned variables were most certainly interrelated in that more education related to higher income and more enduring marriages. Ethnicity also correlated with spousal support (r = .16), which may have been an economic indicator as well. These positive correlations indicated that higher income and more education (as well as more caucasian) related to more perceived spousal support. The marital status variables that most related to spousal support were maternal marital status (r = .43) and family intactness (r = .41). Thus, married mothers and intact families relate to higher perceived spousal support.

Social support also related to economic variables. Those variables again were maternal education (r = .25), paternal education (r = .24), paternal occupation (r = .20), and family income (r = .21). This indicated that more education, a better job, and more income all related to higher levels of social support. The professional support scale failed to correlate with any of these demographic variables. Overall, the FSS correlated mostly with education, income, and marital status.

The Family Resource Scale. Table 42 shows correlations between the FRS and the demographic variables. Time resources failed to correlate strongly with any demographic variable. One exception was the mild negative correlation with the number of children in the home

(r = -.14). This indicated that the more children there were in the home the less perceived time resources were available.

The monetary resource scales correlated with a variety of economic variables. These relationships were stronger for the resources for extras scale. The variables most correlated with extras were maternal education (r = .30), paternal education (r = .36), paternal occupation (r = .35), and family income (r = .48). These positive relationships indicated that more education and higher income were related to the perception of more monetary resources.

The only places where relationships between demographics and the necessities scale were higher than between demographics and the extras scale were on child ethnicity (r = .28) and maternal marital status (r = .25). These correlations indicated that Caucasians and married mothers perceived more monetary resources. This was most true for life's necessities. Overall, the FRS correlated most with education and income.

The Parenting Stress Index. Correlations between the demographic variables and the PSI are presented in Tables 43, 44, and 45. The PSI was divided into child-related stress subscales, parent-related stress subscales, and finally, the child, parent, and total PSI scores.

Table 43 shows the correlations between the PSI and the demographic variables. Stress due to child ability failed to correlate with any of the demographic variables. Stress due to temperament correlated mildly with child age (r = .18) and maternal marital status (r = -.14). The first correlation indicated that the

older the child, the more stress due to child temperament. The second correlation indicated that married mothers suffered from less stress due to child temperament. Other mild correlates included the education, occupation, and income variables, which had coefficients that ranged from -.11 to -.13. These negative relationships all indicated that more education and higher income related to less stress due to child temperament.

Stress related to parent/child interaction was also mildly related to the education, occupation, and income variables. These negative correlations also indicated that more education and higher incomes related to less stress in parent/child interactions. Overall, these subscales showed only minor relationships to mostly economic indicators.

Correlations between the demographic variables and the PSI parent-related stress subscales are presented in Table 44. With only three exceptions, correlations for all of the subscales, other than parent education, were essentially zero. Those exceptions include the relationships between spousal relationship and maternal marital status (r = -.20), and family intactness (r = -.22). Additionally, there was a small correlation between paternal education and birth stress (r = -.20). These correlations indicated that married mothers and intact families suffered less spousal stress, and that more education for the father related to less stress at birth.

The one PSI parent-related stress scale that correlated very strongly with the demographic variables was stress due to parent education. Variables of interest included paternal education

(r = -.78), maternal education (r = -.76), paternal occupation (r = -.58), and family income (r = -.59). Other variables that correlated moderately included paternal age (r = -.36), maternal age (r = -.39), and maternal occupation (r = -.32). In each case, these correlations indicated that more education, better jobs, higher income, and older parents are related to less stress from parent education.

Table 45 presents correlations between the demographic variables and the higher order scales and total score of the PSI. Despite the fact that the mothers filled out these questionnaires over 90% of the time, these totals correlated most with paternal occupation, paternal education, and family income. Although the magnitude of these correlations was low (r = -.15 being the extreme), they were all in the expected direction. That is, better jobs, more education, and higher income related to less stress. This is support to the correlations observed between the FRS and the PSI. Overall, however, the PSI totals did not correlate with any of the child characteristics and most of the family characteristics.

Family Adaptability and Cohesion Evaluation Scales. Correlations between the demographic variables and the FACES III are presented in Table 46. The cohesion scales, both perceived and ideal, correlated mildly with a number of variables. Perceived cohesion related positively to ethnicity (r = .19), maternal education (r = .23), maternal marital status (r = .26), paternal education (r = .25), paternal occupation (r = .20), family income (r = .27), and family intactness (r = .22). These relationships indicated that

Caucasian families with married mothers, where both natural parents lived at home, with more education, better jobs, and higher income perceived a more cohesive family unit. Relationships between these variables and ideal cohesion were similar in pattern, but lower in magnitude. The one exception to this was with child ethnicity (r = .26). Thus, Caucasian families' ideal level of cohesion was higher than their non-Caucasian counterparts.

Child empowerment also related to a variety of demographic variables. The strongest relationships were birth order (r = .22) and number of children in the home (r = .20). These correlations were related, and suggest that larger families empower their children more than smaller families. The family leadership and change scales failed to correlate with any of the child or family characteristics.

Family Inventory of Life Events and Changes. Table 47 presents correlations between the demographic variables and the FILE. For the most part the FILE failed to correlate with any of the child or family characteristics. The few exceptions helped verify the constructs being measured. Life events involving the respondent's children correlated to both birth order (r = .21) and the number of children in the home (r = .23). Thus, the more children the more life events that involved children. In addition, life events related to the respondent's spouse, and those that described separation, correlated with both maternal marital status (r = -.25 and -.24, respectively) and family intactness (r = -.28 and -.25, respectively). This indicated that more life events involving family separation or the respondent's spouse were related to less intact families.

Pregnancies were mildly related to child age (r = -.30), child ethnicity (r = -.21), maternal marital status (r = -.21), and family intactness (r = -.25). Because the FILE covered one year of time, it was not surprising that mothers of very young children, clearly those less than one year of age, were pregnant within the last year. The correlations with maternal marital status and family intactness indicated that the more intact the family, the fewer the number of family pregnancies. Bear in mind that one of the three items of this scale concerned an unmarried member of the family.

The correlation with child ethnicity indicated that either the non-Caucasian families were having more children, or that they were the mothers of the younger children. The latter alternative relationship is controverted by the correlation between child ethnicity and child age (r = -.10). This mild relationship indicated that the non-Caucasian mothers actually had the older children. In addition, correlations between child ethnicity and the number of siblings were small, but negative as well. Thus, the non-Caucasian mothers were having more children.

Finally, life events related to the workplace were related to the number of maternal work hours (r = .20). Again, more work, more life events related to work. This, and the fact that mothers filled out the measure, verified the construct under investigation. For the most part, however, the FILE, which was a demographic checklist, failed to correlate with other demographic variables.

The meaningful relationships between the five measures and the demographic variables were few and relatively weak. However, this is

not surprising. If measuring family functioning were no more than gathering demographic data, then measures like this would be obsolete. The lack of meaningful relationships found in this analysis showed that family functioning is more complex, and that these measures have a place in providing information orthogonal to and beyond family demographics.

Step 7: Outcomes

The following section relates the correlations between the five measures and the Battelle Developmental Inventory. Computed developmental quotients from the BDI were used to represent child development in this analysis. These quotients were computed by dividing age equivalent scores by chronological age, and then multiplying by 100. First, standardized scores were used to eliminate age confounds. This was important because child age did correlate with a number of the family functioning constructs measured by these measures. Second, computed developmental quotients were far more reliable than the published standard scores.

Correlations with the Battelle Developmental Inventory

The information in these tables included correlations with all major scales of the BDI. In addition, motor and communication scores were broken down into their major components.

The Family Support Scale. Table 48 shows the correlations between the BDI and the FSS. The family, spousal, and social support scales did not correlate with any of the BDI scales. The professional

Table 48

Correlations Between the FSS and Battelle Developmental Inventory Developmental Quotients for Children at Least 12 Months of Age

	Family Support	Spousal Support	Social Support	Pro Support	Total Support
Personal/Social	.05	.06	.08	-.10	.03
Adaptive Behavior	.04	.03	.03	-.18	-.03
Motor Total	-.04	.01	-.06	-.27	-.13
Gross Motor	-.03	.01	-.05	-.28	-.13
Fine Motor	-.04	.00	-.05	-.20	-.10
Communication Total	-.02	.07	.05	-.12	.00
Expressive	-.02	.03	.04	-.13	-.02
Receptive	.00	.11	.07	-.08	.04
Cognition	-.02	.06	-.02	-.20	-.06
Development Total	.01	.06	.03	-.18	-.03

support scale, however, did correlate negatively with all of the BDI scales. This indicated that lower functioning children were related to more professional support. The strongest relationships with professional support were with gross motor (r = -.28), fine motor (r = -.20), motor total (r = -.27), and cognition (r = -.20). Despite an overall correlation of -.03 between these measures, the professional support scale correlated mildly (r = -.18) with the BDI total, and the motor scales related most to the FSS total.

The Family Resource Scale. Table 49 presents the correlations between the FRS and the BDI. All of the correlations in this table were positive. This indicated that more resources, both time and monetary, were related to higher child development. Time resources correlated most highly with social development (r = .13) and adaptive

Table 49

Correlations Between the FRS and Battelle Developmental Inventory Developmental Quotients for Children at Least 12 Months of Age

	Time	Necess	Extras	Total Resources
Personal/Social	.13	.17	.18	.19
Adaptive Behavior	.13	.14	.16	.17
Motor Total	.07	.08	.11	.10
Gross Motor	.07	.06	.11	.10
Fine Motor	.08	.11	.11	.11
Communication Total	.08	.08	.13	.12
Expressive	.07	.07	.10	.10
Receptive	.09	.07	.13	.12
Cognition	.06	.10	.14	.12
Development Total	.12	.13	.17	.16

behavior (r = .13). Likewise, resources for necessities correlated most highly with social development (r = .17) and adaptive behavior (r = .14). Resources for extras correlated between .10 and .18 for all of the BDI scales, but, like the other two scales of the FRS, resources for extras correlated the strongest with social development (r = .18) and adaptive behavior (r = .16).

Overall, the relationship between the BDI and the FRS total was very similar to that of the resources for extras scale, with the largest correlation coefficients being with social development (r = .19) and adaptive behavior (r = .17), and all other correlations being above .10. Not surprisingly, the BDI total correlated best with the resources for extras scale (r = .17), with the FRS and BDI totals correlating at .16.

The Parenting Stress Index. Correlations between the BDI and the PSI child-related subscales are presented in Table 50. The ability subscale negatively correlated very strongly with all scales of the BDI. These negative correlations indicated, as would be expected, that high levels of stress due to child ability are related to lower levels of child development. These correlations ranged from -.33 (expressive communication) to -.50 (adaptive behavior).

Table 50

Correlations Between the PSI Child Scales and Battelle Developmental Inventory Developmental Quotients for Children at Least 12 Months of Age

	Ability	Temperament	Interact
Personal/Social	**-.43**	**-.06**	**-.22**
Adaptive Behavior	**-.50**	**-.02**	**-.19**
Motor Total	**-.40**	**.14**	**-.06**
Gross Motor	-.38	.15	-.04
Fine Motor	-.41	.08	-.10
Communication Total	**-.37**	**-.01**	**-.13**
Expressive	-.33	.03	-.10
Receptive	-.37	-.07	-.17
Cognition	**-.43**	**.01**	**-.15**
Development Total	**-.48**	**.02**	**-.18**

Stress due to child temperament correlated only mildly with gross motor (r = .15), and to a lesser degree, motor total (r = .14), and not at all with the other scales. These positive correlations indicated that higher gross motor functioning was related to higher amounts of stress related to child temperament.

Finally, stress due to parent/child interaction negatively correlated mildly with most of the BDI scales. The strongest relationships were with social development (r = -.22), adaptive behavior (r = -.19), receptive language (r = -.17), and total development (r = -.18). These negative correlations indicated that higher levels of social skill, adaptive behavior, and receptive language were related to more stress in parent/child interaction.

Correlations between the BDI and the PSI parent-related subscales are presented in Table 51. With the exception of the birth stress subscale, the PSI parent-related scales failed to correlate above .20 with any of the BDI scales. Birth stress was negatively correlated with all of the BDI scales, but most strongly with adaptive behavior (r = -.20), gross and total motor (r = -.20), fine motor (r = -.18), cognition (r = -.18), and total development (r = -.18). These negative correlations indicated that higher levels of stress at birth were related to lower overall child development.

Correlations between the BDI and PSI total scores are presented in Table 52. The PSI correlated most strongly with social development (r = -.21), adaptive behavior (r = -.23), and receptive communication (r = -.20). The BDI total development correlated most strongly with the child-related stress score (r = -.29). Overall, the measures correlated at -.19.

The Family Adaptability and Cohesion Evaluation Scales. Table 53 presents the correlations between the BDI and the FACES III. These measures failed to correlate. However, positive correlations for both

Table 51

Correlations Between the PSI Parent Scales and Battelle Developmental Inventory Developmental Quotients for Children at Least 12 Months of Age

	RR	AT	ED	SC	SP	SI	GC	HE	BS
Personal/Social	-.07	-.01	-.13	-.14	-.05	-.07	.04	.04	-.13
Adaptive Behavior	-.11	.00	-.06	-.12	-.07	-.07	.02	.02	-.20
Motor Total	-.04	.09	-.02	.00	.00	-.01	.12	.08	-.20
Gross Motor	-.05	.08	-.01	.02	.00	-.02	.11	.06	-.20
Fine Motor	-.04	.08	-.03	-.04	-.01	-.01	.10	.09	-.18
Communication Total	-.07	.03	-.13	-.15	-.02	-.04	.02	.04	-.13
Expressive	-.06	.04	-.12	-.14	.01	-.02	.02	.04	-.13
Receptive	-.09	-.01	-.10	-.15	-.05	-.06	.00	.04	-.12
Cognition	-.07	.03	-.08	-.08	-.01	-.03	.05	.07	-.18
Development Total	-.08	.03	-.10	-.11	-.04	-.05	.06	.06	-.18

Table 52

Correlations Between the PSI Totals and Battelle Developmental Inventory Developmental Quotients for Children at Least 12 Months of Age

	PSI Child	PSI Parent	PSI Total
Personal/Social	-.31	-.09	-.21
Adaptive Behavior	-.32	-.11	-.23
Motor Total	-.16	-.01	-.09
Gross Motor	-.14	-.01	-.08
Fine Motor	-.20	-.02	-.11
Communication Total	-.23	-.07	-.16
Expressive	-.18	-.06	-.13
Receptive	-.27	-.10	-.20
Cognition	-.26	-.05	-.16
Development Total	-.29	-.07	-.19

Table 53

Correlations Between the FACES III and Battelle Developmental Inventory Developmental Quotients for Children at Least 12 Months of Age

	Per Co	Id Co	Ch Emp	Fam Lead	Change
Personal/Social	**.15**	**.07**	**.03**	**.01**	**-.05**
Adaptive Behavior	**.10**	**.03**	**.01**	**-.02**	**-.06**
Motor Total	**.05**	**.02**	**-.01**	**-.01**	**-.06**
Gross Motor	.04	.00	-.03	-.02	-.07
Fine Motor	.09	.06	.01	.00	-.07
Communication Total	**.13**	**.08**	**.02**	**.00**	**-.05**
Expressive	.13	.08	.02	-.02	-.06
Receptive	.11	.06	-.01	.00	-.05
Cognition	**.09**	**.08**	**.02**	**.01**	**-.04**
Development Total	**.11**	**.06**	**.01**	**.00**	**-.06**

perceived and ideal cohesion, and all BDI scales suggest that higher child functioning related to more family cohesion, even be it small. The change scale also showed a trend. All BDI scales correlated negatively with the change score of the FACES III. This indicated that higher levels of child development were related to less adaptability relative to change.

The Family Inventory of Life Events and Changes. Correlations between the BDI and the FILE are presented in Table 54. These measures failed to correlate. The highest observed correlations were between the illness scale of the FILE and some of the scales of the

Table 54

Correlations Between the FILE and Battelle Developmental Inventory Developmental Quotients for Children at Least 12 Months of Age

	Non-Events	Events	FILE Total
Personal/Social	-.05	-.04	-.05
Adaptive Behavior	-.08	-.01	-.06
Motor Total	-.01	.00	.00
Gross Motor	.00	-.01	.00
Fine Motor	-.03	-.01	-.02
Communication Total	-.02	-.05	-.03
Expressive	-.01	-.04	-.02
Receptive	-.03	-.03	-.03
Cognition	-.04	-.04	-.04
Development Total	-.05	-.03	-.04

	Res	Fam	Chi	Spo	Par	Fri	InL	Rel	CoW
Personal/Social	-.08	-.06	-.07	.02	.05	-.02	-.06	.01	.04
Adaptive Behavior	-.09	-.07	-.09	.06	.07	.00	-.07	.00	.03
Motor Total	-.02	-.03	-.02	.07	.08	-.01	-.02	.02	.06
Gross Motor	-.01	-.03	-.01	.06	.08	-.01	-.03	.02	.06
Fine Motor	-.04	-.04	-.05	.05	.08	-.01	-.02	.02	.05
Communication Total	-.03	-.07	-.03	.05	.09	-.01	-.06	.00	.03
Expressive	-.01	-.07	-.01	.08	.10	-.01	-.04	-.01	.02
Receptive	-.04	-.06	-.05	.02	.06	.01	-.06	.02	.05
Cognition	-.05	-.06	-.07	.03	.08	.00	-.02	.04	.07
Development Total	-.06	-.07	-.07	.05	.09	-.02	-.05	.02	.05

(table continues)

	Con	Sep	Ill	Sex	Prg	Dbt	Wrk	Fin	Dth	Lgl
Personal/Social	-.07	.06	-.05	-.02	-.01	-.04	.01	.00	.01	-.03
Adaptive Behavior	-.08	.08	-.11	.02	.00	-.06	.04	-.01	-.02	-.03
Motor Total	-.01	.08	-.12	.04	-.03	.00	.07	.04	-.06	.02
Gross Motor	.01	.07	-.12	.05	-.03	.00	.06	.02	-.05	.01
Fine Motor	-.04	.08	-.12	.00	-.03	-.01	.06	.04	-.04	.01
Communication Total	-.03	.07	-.05	.02	-.07	-.06	.00	-.02	.00	.00
Expressive	-.01	.08	-.05	.04	-.07	-.05	.00	-.01	.00	.00
Receptive	-.04	.04	-.02	-.01	-.05	-.07	-.01	-.03	.01	.00
Cognition	-.04	.05	-.08	.00	-.06	-.06	.06	.01	-.01	.00
Development Total	-.06	.08	-.10	.02	-.04	-.04	.05	.01	-.02	-.02

BDI, with these correlations not exceeding -.12. This negative relationship mildly indicated that more illnesses in the family and with family acquaintances were related to lower overall child development.

In summary, these measures, with the exception of the PSI child-related stress scale, did not correlate in a meaningful way with any of the five measures. This, however, does not mean that their value is lost in this context. The following section describes some basic regression analyses where these variables were used to predict child functioning.

Step 8: Regression Analyses

Table 55 presents the results of a linear regression analysis where the FSS, FRS, PSI, FACES III, and FILE subscales were used to

Table 55

Regression Results for All Family Measure Scales Predicting Child Development

Variable	B	SE B	Beta	T	Sig T
Family Support Scale					
Family	.587575	.357190	.059492	1.645	.1005
Professional	-.533377	.219983	-.089684	-2.425	.0156
Social	.169648	.191527	.038078	.886	.3761
Spousal	.249150	.249001	.043207	1.001	.3174
Family Resource Scale					
Extras	.162474	.139198	.070585	1.167	.2436
Necessities	.177071	.258792	.033834	.684	.4941
Time	-.013937	.157833	-.004285	-.088	.9297
Child-Related Stress					
Abilities	-1.589369	.111582	-.615593	-14.244	.0000
Interaction	-.200575	.201390	-.037018	-.996	.3197
Temperament	.768185	.115718	.266186	6.638	.0000
Parent-Related Stress					
Attachment	.768800	.277941	.108823	2.766	.0059
Guilt	.864688	.333319	.106991	2.594	.0097
Education	-.894906	.475209	-.069669	-1.883	.0602
Health	1.495544	.359244	.158013	4.163	.0000
Birth	-.663953	.276941	-.091673	-2.397	.0168
Restr of Role	.073364	.160366	.020781	.457	.6475
Sense of Comp	-.898878	.301015	-.117101	-2.986	.0029
Social Isol	.206099	.237121	.041026	.869	.3851
Spouse Rel	.250763	.230349	.049502	1.089	.2768
Family Adaptability and Cohesion Evaluation Scales					
Change	-.409409	.227468	-.066178	-1.800	.0724
Child Empower	.202322	.151672	.049051	1.334	.1827
Ideal Cohes	-.001392	.188117	-.000311	-.007	.9941
Perceived Coh	.026472	.165779	.006872	.160	.8732
Leadership	.182721	.206938	.030505	.883	.3776
Family Inventory of Life Events and Changes					
Events	1.002274	1.089216	.116434	.920	.3579
Non-Events	.646965	1.071981	.129236	.604	.5464

(table continues)

Variable	B	SE B	Beta	T	Sig T
Children	-1.236361	1.124953	-.119146	-1.099	.2722
Coworker	.874869	2.672590	.014066	.327	.7435
Family	-3.600828	1.080700	-.545606	-3.332	.0009
Friends	2.040224	1.605376	.067914	1.271	.2043
Inlaws	1.591272	2.945531	.025677	.540	.5892
Parents	1.528671	1.326561	.081868	1.152	.2496
Relative	.555421	1.838959	.020138	.302	.7627
Respondent	-1.034321	.866869	-.135647	-1.193	.2333
Spouse	-.210259	1.407196	-.015028	-.149	.8813
Conflict	1.637949	1.225393	.193918	1.337	.1818
Death	-2.254914	2.032699	-.053612	-1.109	.2677
Debt	.334049	.910955	.027566	.367	.7140
Finance	2.408423	.994491	.296277	2.422	.0157
Illness	.024966	1.080645	.001196	.023	.9816
Legal	6.093254	2.302857	.099621	2.646	.0084
Pregnant	-.199484	2.592437	-.002932	-.077	.9387
Separate	.745759	1.348896	.036773	.553	.5806
Sexual Con	-.413493	2.219255	-.008245	-.186	.8523
Work	.219584	1.025446	.013588	.214	.8305
(Constant)	64.821745	13.273998		4.883	.0000

predict child development as measured by the BDI-computed developmentally quotient scores. The family measure total scores were not used because they were a linear combination of the subscales and would thus not enter in the regression equation. The subscale variables were entered into the regression together, and not stepwise.

The results of this regression analysis showed a multiple $\underline{R}$ of .663 and $\underline{R}^2$ value of .440. This indicated that these family functioning measures provide 44% of the information necessary to perfectly predict the developmental quotient of the child subjects. Table 56 shows the results of a similar regression analysis with the demographic variables added into the equation. The multiple $\underline{R}$ increased to .759, and the $\underline{R}^2$ value increased to .576. The sample sizes for these analyses were 637 and 410, respectively.

Table 56

Regression Results for All Family Measure Scales and Demographic Variables Predicting Child Development

Variable	B	SE B	Beta	T	Sig T
Family Support Scale					
Family	.452501	.458757	.044560	.986	.3246
Professional	-.584127	.274653	-.093077	-2.127	.0341
Social	.226737	.229026	.050387	.990	.3229
Spousal	-.026299	.328162	-.004146	-.080	.9362
Family Resource Scale					
Extras	-.106420	.196186	-.043659	-.542	.5879
Necessities	.083535	.340909	.014111	.245	.8066
Time	.292225	.214321	.088892	1.363	.1736
Child-Related Stress					
Abilities	-1.864941	.133964	-.716117	-13.921	.0000
Interaction	-.202574	.254572	-.036364	-.796	.4267
Temperament	.965523	.144247	.327692	6.694	.0000
Parent-Related Stress					
Attachment	.603602	.353180	.080143	1.709	.0883
Guilt	.390420	.412556	.047274	.946	.3446
Education	.796932	.974647	.061144	.818	.4141
Health	1.174552	.454890	.121125	2.582	.0102
Birth	-.500035	.334731	-.068031	-1.494	.1361
Restr of Role	.325317	.206380	.087904	1.576	.1159
Sense of Comp	-.777022	.383214	-.097816	-2.028	.0434
Social Isol	.621097	.301510	.122613	2.060	.0401
Spouse Rel	-.215450	.294670	-.040944	-.731	.4652
Family Adaptability and Cohesion Evaluation Scales					
Change	-.441449	.295698	-.067469	-1.493	.1364
Child Empower	.189505	.190281	.045547	.996	.3200
Ideal Cohes	-.057518	.242625	-.011459	-.237	.8127
Perceived Coh	.048785	.210299	.011937	.232	.8167
Leadership	.092798	.268215	.014930	.346	.7296
Family Inventory of Life Events and Changes					
Events	1.457248	1.358653	.155060	1.073	.2842
Non-Events	.409157	1.396944	.077349	.293	.7698
Children	-1.096957	1.388320	-.098776	-.790	.4300
Coworker	2.182268	3.193280	.034607	.683	.4948
Family	-5.034951	1.330086	-.720651	-3.785	.0002

(table continues)

Variable	B	SE B	Beta	T	Sig T
Friends	1.018402	2.042431	.032325	.499	.6184
Inlaws	.651718	3.703426	.010279	.176	.8604
Parents	.810392	1.669267	.040842	.485	.6276
Relative	1.960924	2.315224	.067748	.847	.3976
Respondent	-1.681135	1.150002	-.200733	-1.462	.1447
Spouse	.263736	1.831806	.017399	.144	.8856
Conflict	3.429970	1.517213	.381034	2.261	.0244
Death	-3.944219	2.637333	-.087152	-1.496	.1357
Debt	.251927	1.153907	.019711	.218	.8273
Finance	3.224765	1.261434	.384708	2.556	.0110
Illness	.716170	1.415942	.032179	.506	.6133
Legal	11.019500	3.618228	.142163	3.046	.0025
Pregnant	3.121899	3.377350	.042232	.924	.3559
Separate	.428949	1.715307	.019749	.250	.8027
Sexual Con	-3.505452	2.926188	-.062786	-1.198	.2318
Work	.636273	1.295927	.037747	.491	.6238
Child Demographic Variables					
Gender	-2.995941	1.896857	-.061077	-1.579	.1151
Child Age	-.091660	.074407	-.055931	-1.232	.2188
Ethnicity	3.497943	3.181627	.046620	1.099	.2723
Birth Order	.561827	1.320341	.031638	.426	.6707
Maternal Demographic Variables					
Age	-.081828	.285146	-.019829	-.287	.7743
Education	-.090786	.699053	-.008513	-.130	.8967
Occupation	-.532384	1.206134	-.027098	-.441	.6592
Work Hours	.093049	.084804	.069130	1.097	.2733
Marital Status	1.621011	6.984350	.019254	.232	.8166
Paternal Demographic Variables					
Age	.169785	.243007	.044876	.699	.4852
Education	1.132807	.677609	.111765	1.672	.0955
Occupation	1.410499	1.221758	.065982	1.154	.2491
Work Hours	.089603	.073688	.052609	1.216	.2248
Family Demographic Variables					
Income	.216259	.519400	.025501	.416	.6774
Intactness	-5.013779	7.264685	-.056543	-.690	.4906
# of Adults	-.661217	1.931597	-.014491	-.342	.7323
# of Children	-1.557316	1.243631	-.092523	-1.252	.2113
(Constant)	51.251929	24.114389		2.125	.0343

As can be seen in Tables 55 and 56, the major predictors were stress due to child ability and child temperament. Note, however, that the contribution of stress due to child temperament was in the unexpected direction. That is, higher stress was related to higher child functioning. This was due to the colinearity between the PSI child subscales. In fact, there was clearly a great deal of multicolinearity involved in the PSI subscales alone. This was indicated by the few parent-related stress subscales with positive regression coefficients. In reality, all of these coefficients should have been negative.

Despite the problems of multicolinearity, this regression analysis demonstrated that these measures related to child development. The final model for this prediction is beyond the scope of this dissertation. It was presented here only to show that these measures were useful in the context of early intervention family assessment.

CHAPTER V

SUMMARY

Public Law 99-457 initiated significant expansion of appropriate early intervention services for all young children with disabilities and emphasized the importance of family-based support and intervention. Most previous early intervention research has been primarily child focused, and, consequently, information about the families of children involved in efficacy studies and the effects of early intervention on the family has been largly ignored.

In response to the increased emphasis in early intervention on assessing family functioning, there has been substantial effort to develop instruments that can measure important aspects of family functioning with families of children with disabilities. While the multitude of recently developed family measures has given researchers and clinicians a variety of instruments from which to choose, research on the quality of the data derived from these instruments has lagged behind. This dissertation has demonstrated that instruments like these can be evaluated with alternative populations and has shown internal structures both similar and dissimilar to internal structures based on data from normal broadbased populations. In addition, this study has also demonstrated the potential usefulness of the measures in early intervention family assessment.

Because this study has examined five measures across the entire process of psychometric validation, the conclusions contained in this chapter will be summarized in that fashion. Thus, each measure will be examined one at a time, then in concert with the other measures.

The Family Support Scale

The final model of the FSS demonstrated a stronger internal structure for this population than did that of the original authors. In addition, the scales recommended here made more sense in terms of how items with like content were grouped. Despite the fact that Burrell (1990) was able to confirm the original scale structure with a sample of children with disabilities, the relatively large sample size in this study lends more credence to the results discovered here.

Internal consistency reliability coefficients were at least as high as those calculated from previous research (Burrell, 1990; Dunst & Trivette, 1986), and the invariance analysis suggested reliability across samples as well.

Summary statistics demonstrated that these subjects received most of their support from immediate family members and their child's physician and therapist. Despite the high means from these items, the FSS seemed mostly a measure of social support, as demonstrated in the high social support scale and FSS total correlation.

The Family Resource Scale

The final model of the FRS also demonstrated a stronger structure than that proposed by the original authors. Items with like content, again, grouped in a way that made more sense than the strategy employed by the test authors. Internal consistency coefficients were similar to those published in previous research (Burrell, 1990; Dunst & Leet, 1985; 1987), and the invariance analysis suggested that there was stability across samples.

Despite the above evidence concerning the reliability of the FRS, it is clear that this measure suffered from a skewed distribution of item responses for those items in the resources for necessities scale. The limited range of responses, or in this case a ceiling effect, where almost every respondent perceived adequate resources for every item in that scale, caused resultant correlations to diminish, and reliability coefficients to increase. Thus, relationships that may well have existed were vitiated by this restriction of range, and the computed reliability of this scale and the total FRS were artificially inflated.

This is most clearly seen in the correlations discussed in the previous chapter; however, the effect was also seen in the summary data. Only two item means, for the entire FRS, were below the center of the Likert scale. In addition, the high interscale correlations showed that these scales barely differentiated between the three constructs. Thus, the FRS was most useful in measuring time resources, and monetary resources through the resources for extras scale. The resources for necessities scale may not provide detail beyond the other monetary scale or FRS total.

The Parenting Stress Index

The final models for the PSI were, in many ways, quite different from the model suggested by Abidin (1990). Nearly 20% of the items of the PSI were dropped in this analysis. This made the instrument quite different from its original form. Also, the number of constructs under investigation shifted more dramatically than it did for the

other measures. Despite the dramatic change in the structure of the PSI, the final models still contained the original higher order constructs, and most of the parent-related stress subconstructs.

Internal reliability coefficients were quite similar to those in the literature (Abidin, 1990; Burrell, 1990; Hauenstein, Marvin, et al., 1987), and, again, the invariance analyses demonstrated stability across samples.

Summary statistics showed that these parents suffered from higher levels of stress than families from the normal population. Overall, stress was highest when related to child ability and temperament. For the parent-related subscales, stress levels were similar across the board. The average parent scored at the 77th percentile of the norm group for stress related to the child, at the 62nd percentile for stress related to the parent, and at the 70th percentile overall. Despite the fact that this clearly indicated that these parents of children with disabilities showed higher levels of stress than the normal population, their average figures deviated less than one standard deviation from the mean.

Overall, the PSI subscales in both the child- and parent-related stress domains showed only moderate intercorrelations. This provided some evidence that the PSI did address a variety of somewhat independent subconstructs of parenting stress.

The Family Adaptability and Cohesion Evaluation Scales III

The final model for the FACES III did not differ substantially from the model suggested by the original test authors. It did, however, improve the overall indices of fit and reliability. Computed internal consistency reliability coefficients for the model proposed here were higher than those reported by the test authors (Olson et al., 1985). Although this change was minor, and potentially unnecessary, it did parallel the modification proposed by Noller and Shum (1990). Thus, there was some evidence that the final model proposed here was the best overall model for this measure for this population.

Summary statistics suggested that these families were not substantially different from those of the normative group. This was true for the cohesion scale, but, with the different scoring strategy, undetermined for the adaptability scales. Thus, it may be that these families were more rigid, as Mortensen (1991) concluded.

Finally, correlations computed here between the constructs of cohesion and adaptability contradicted some previous research (Noller & Shum, 1990; Perosa & Perosa, 1990), and agreed with other earlier studies (Mortensen, 1991; Olson et al., 1985). Each of these studies used large sample sizes; however, this study, like Mortensen (1991) only, used a sample from a special population. The one component of adaptability that correlated to any degree with cohesion was that of child empowerment, and because this was a new scale, comparisons to past research were lost. Relationships between perception and

idealism seemed high, but not congruent. Thus, there may be some value in continuing to pursue the measurement of idealistic family functioning.

The Family Inventory of Life Events and Changes

Although the strategy for scoring and interpreting the FILE proposed here was not tested statistically, the final model did provide a great deal of concurrent validation for some of the other measures. The internal consistency reliability coefficient computed with this sample for the total FILE was nearly identical to that reported by the test authors (McCubbin et al., 1983).

This high reliability seems incongruous with a scale that measures seemingly independent, or uncorrelated, life events. That is one of the reasons why a factor analysis was not conducted with this measure. However, the high internal consistency may be explained by the lack of response variance on many of the items. The variance on many of the items was very low. This floor effect is similar to the ceiling effect found on the FRS. The restriction of range in the item responses decreased correlations and inflated the internal consistency coefficient.

The above sections addressed the first, and half of the second objective of this study, examining the internal structure of each measure, and establishing levels of reliability. The remainder of the second objective, establishing concurrent validity, and the last objective, computing the relationships to child functioning, are summarized in Table 57.

Table 57

Relationships Between the Six Measures' Total Scores and How They Related to A Priori Hypotheses

	PSICH	PSIPA	COH	ADAPT	FILE	FRS	FSS
PSI							
Parent	**.57** (+)						
FACES III							
Cohesion	**-.19** (-)	**-.32** (-)					
Adaptability*	**.02** (0)	**-.02** (0)	**.11** (0)				
FILE	**.19** (+)	**.35** (+)	**-.16** (-)	**.09** (0)			
FRS	**-.28** (-)	**-.46** (-)	**.39** (+)	**.00** (0)	**-.39** (-)		
FSS	**-.16** (-)	**-.27** (-)	**.24** (+)	**.11** (0)	-.04 (-)	**.29** (+)	
BDI	**-.29** (-)	**-.07** (0)	**.11** (0)	**-.02** (0)	**-.04** (0)	.16 (0)	-.03 (+)

Note. A priori hypotheses are given in parentheses below the corresponding correlations. Symbols represent an hypothesized positive "+," negative "-," or zero "0" correlation. Correlations in bold indicate that they matched the a priori hypothesis if the correlation magnitude cutoffs were .15 and -.15

* The adaptability correlations were drawn from an average of the three adaptability subscales

This table shows both the correlations between the measures, but also provides a priori hypotheses concerning those relationships. These a priori hypotheses were drawn from previous research reviewed in Chapter II.

Overall, the PSI correlated negatively with family cohesion. This supports previous research (Boyce et al., 1991; Krauss et al.,

1989; Mortensen, 1991) which also found negative correlations between parenting stress and family cohesion. Specifically, and not surprisingly, cohesion was most related to parent/child interaction, spousal relationships, social isolation, and attachment to the child. The relationship between parenting stress and family adaptability was basically nonexistent. This also supports previous research (Boyce et al., 1991; Mortensen, 1991).

Life events also related strongly to parenting stress. Hanson and Hanline (1990) concluded that there was a relationship between life experiences and parenting stress, and the results of this study expanded on that notion. Previous research at EIRI (Boyce et al., 1991; Pratt, 1992; Waidler & Pezzino, n.d.) also demonstrated that there was a relationship between stress and life events. The results of this study expanded on this by specifying that the sources of stress were mostly non-event related. That is, stress was made up more of daily increases in stressors than it was with shattering one-time events.

The relationship between parenting stress and family resources was also highly negative. This too was predicted in the literature (Boyce et al., 1991; Pratt, 1992; Waidler & Pezzino, n.d.). This relationship was most clearly demonstrated in the relationship between time resources and stress. Child ability and parent-related stress in general all correlated highly with time resources. The monetary resources correlated moderately with stress due to parent education and social isolation, but less so for the other PSI subscales.

The PSI also correlated moderately with the FSS. This negative relationship between stress and social support was demonstrated by a number of previous studies (Boyce et al., 1991; Castaldi, 1988; Dunst & Trivette, 1986; Pratt, 1992; Speltz et al., in press; Waidler & Pezzino, n.d.; Zimmerman, 1980). The FSS correlated most highly with stress due to child temperament. Contrary to previous research (Dunst & Trivette, 1986), the FSS did not correlate as highly with parent/child interaction. The FSS spousal support related to the PSI spousal relationship subscale, while social support related to social isolation. This was not a surprise and serves to establish the convergent validity of both measures.

Finally, the PSI was the only measure to correlate strongly with child development. The review of literature covers a myriad of studies that claimed that the PSI scores were significantly higher for samples of parents with children with disabilities. This relationship was also backed up, in a correlational sense, by Zakreski (1983). The previous research at EIRI specifically pointed out that only the child-related stress scale discriminated samples of children by development (Boyce et al., 1991; Innocenti et al., 1992; Pratt, 1992). This is exactly what was discovered here. Obviously, stress due to child ability was correlated with child development. However, this was the only PSI subscale with high correlations with child development. Mild relationships with the BDI were evident for the parent/child interaction and the birth stress subscales.

The FACES III adaptability scales did not correlate with anything. Earlier research at EIRI (Boyce et al., 1991; Mortensen,

1991) came to that same conclusion. Family cohesion, however, did show some relationships to the other measures of family functioning. The FACES III perceived cohesion scale correlated mildly with the FILE, which corroborated the outcomes reported by Boyce et al. (1991).

In addition, cohesion was related very strongly to family resources. Again, earlier research at EIRI (Boyce et al., 1991; Mortensen, 1991) concluded the same. This relationship seemed to be fairly equal among the various scales of the FRS. That is, perceptions of both time and monetary resources were equally related to perceived family cohesion.

Family cohesion also related to family support as measured by the FSS. More support being related to more integrated families was concluded in three previous studies (Boyce et al., 1991; Dunst & Trivette, 1986; Mortensen, 1991). In these analyses, family cohesion related most strongly to spousal and social support. In all of these analyses, it was the perceived cohesion, not the ideal, that related the strongest to the other measures.

No previous research, other than one study at EIRI, focused on the relationship between family cohesion and child development. Boyce et al. (1991) concluded that there was no relationship between the two. This study confirmed that adaptability, in all of its forms, did not relate to child functioning; however, there was a mild and positive relationship between perceived family cohesion and child development, the correlation being strongest for social development. It is not inconceivable that this relationship was associated with the correlations between stress and development, and stress and cohesion.

That is, higher child functioning was related to reduced stress, which was related to more cohesive families.

Life events and changes were highly related to family resources. This is not surprising considering that many of the items on the FILE were financial in nature. Thus, the monetary scales, and more dramatically, the resources for extras scale, correlated with the debt, finance, family, spouse, and respondent scales of the FILE. Time resources correlated with the non-events, the respondent, and the conflict scales of the FILE. This would imply that decreases in resources, both time and monetary, increase the amount of family conflict. This is especially true with the perception of time resources.

Life events and changes were not related, in general, to family support. The only exception was the relationship between spousal support and the spouse and separation scales of the FILE. In addition, the FILE did not relate to the BDI. This lack of a relationship was reported in previous research (Boyce et al., 1991). No individual correlations between the subscales of either measure related at all.

Family resources did correlate with family support. Previous research has demonstrated that family support correlated with constructs related to resources (Dunst et al., 1984; Dunst & Trivette, 1986). The correlations computed in this study indicated that spousal and social support related most highly to resources, both time and monetary, and that all of the resources scales correlated about the same with total support.

Family resources correlated with child development. This relationship was mostly seen in the monetary scales, and the strongest correlations were with child social development. Previous research at EIRI demonstrated that there was a relationship between time resources and overall development, but that other resources did not correlate with the BDI (Boyce et al., 1991). In this case, the stronger correlations were with the monetary scales; however, all computed correlations were positive. Thus, however small, there was a relationship which indicated that more money means better overall child development in general, and better child social development specifically.

Finally, family support failed, with one exception, to correlate with child development. Previous research indicated that family support related to parent/child interaction (Dunst & Trivette, 1986), and that it was able to discriminate families with children with disabilities (Dyson & Fewell, 1986). However, previous research also concluded that the FSS was unrelated to child behavior (Dunst et al., 1990). This study showed that the FSS did not correlate in any way with child development except in the area of professional support. This relationship was most dramatic for motor functioning. This makes sense, in that children with motor impairments may rely on more professional helpers.

In general, these measures correlated in ways that supported their validity. The magnitude of these relationships, however, was not as strong as was reported in previous research. This may have been due to the psychometric process. If the measurement of the

constructs was refined, then their interrelationships would be reduced. Thus, this research has potentially provided a better strategy for using these measures with this population.

Conclusions

The assessment of families participating in early intervention programs can be useful in a variety of ways; however, data from these instruments can be more useful when their relationship to child outcomes is established. In considering the importance of family functioning in current early intervention programs and the potential impact on the type of intervention delivered, this investigation of the psychometric properties of these widely used measures of family functioning was essential.

The specific purpose of the proposed research was to conduct a full psychometric assessment of five of the most widely used measures of family functioning for families with children with disabilities. The conclusions that can be drawn from the results of these analyses are as follows.

1. Each of these measures was strengthened by the new scoring strategies suggested in this dissertation. The final models tested using LISREL produced models with less unexplained variance than those proposed by the original authors. It is suggested that future users of these measures with this type of population employ the scoring procedures described in this research.

2. Each of these measures showed high internal consistency reliability coefficients. In fact, the reliability coefficients

computed in this study were at least as high as those computed by the test authors. Thus, these measures were still consistent with this population.

3. Each of these measures demonstrated concurrent validity, both in the forms of divergent and convergent validity. Correlations within measures, with other measures, and with demographic variables showed that these family functioning questionnaires measure what they purport to measure.

4. Specifically, the FRS suffered from too many items that drew a limited response. This diminished its usefulness, and in fact, only two of the scales, time resources and monetary resources for extras, seemed valuable.

5. The FILE suffered from the same fate. It is possible that the FILE has too many items to be useful. From the analyses here, the broader scales provided the most functional data, and may well be measured with fewer items.

6. These measures, in general and with only a few exceptions, did not relate to child development. The only large predictor was child-related stress. Mild relationships occurred with family cohesion and family resources. The rest of the measures did not correlate.

7. Despite the lack of individual predictors of child development, when taken as a whole, these measures accounted for over 50% of the variance needed for a perfect prediction of child development. This implies that these measures were very useful for

family assessment in early intervention research and early intervention service provision.

Suggestions for Future Research

The process of psychometric validation is a cyclical process. In this dissertation, five measures of family functioning have been improved on and validated for this special population using a variety of simple to sophisticated techniques. One obvious next step is to take what has been learned here and compose new measures, measures that anticipate the problems found in previous measures, that combine all of the constructs investigated here, that provide information useful for a variety of purposes, and that are user friendly. These new measures would then go through the same validation process, and the cycle repeats.

Aside from the process described above, this dissertation has shown a glimpse of the inner workings of a model of family functioning and its relationship to child functioning. Another next step would be to continue examining the relationships observed in this study. A great deal of work into the character and dynamics of family functioning needs to be conducted. The use of these measures provides a core of assessment essential to the execution of this task. Future researchers should continue with correlational research designs to provide greater insight into the nature of family functioning and its impact on child development.

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APPENDICES

Appendix A

Scale Breakdown of the Family Inventory of Life Events and Changes

Family Inventory of Life Events and Changes

Non-Events

1 Increase in father's time away
2 Increase in mother's time away
3 Family member has emotional problems
4 Family member has drug/alcohol problems
5 Increase in spousal conflict
6 Increase in parent/child conflict
7 Increase in sibling conflict
8 Increase in difficulties managing teenagers
9 Increase in difficulties managing school kids
10 Increase in difficulties managing preschoolers
11 Increase in difficulties managing toddlers
12 Increase in difficulties managing infants
13 Increase in outside child activities
14 Increase in disagreement about activities
15 Increase in unresolved issues
16 Increase in unfinished chores
17 Increase in in-law conflict
20 Increase in difficulties with ex-spouse
21 Increase in difficulties in sex relationship
33 Increase in credit card debts
34 Increase in medical/dental costs
35 Increase in necessity costs
36 Increase in child education costs
37 Delay in receiving alimony payments
43 Decrease in job satisfaction
44 Member had difficulties with work colleagues
45 Family member promoted
52 Increase in difficulties managing ill member
54 Increase care to parents
55 Difficulty arranging child care
69 Sexual abuse or violence in the home

Transitions (Events)

18 Spouse/parent separated, divorced
22 Unwanted or difficult pregnancy
23 Unmarried family member pregnant
24 Family member had abortion
25 Family member gave birth or adopted
30 New business started
31 Purchased or built a home
38 Family member changed jobs
39 Family member quit or lost job
40 Family member retired
41 Member started or returned to work
42 Member had extended work absence
46 Moved to new home or apartment
47 New school for child
48 Parent/spouse became ill/injured
49 Child became ill/injured

50 Relative/friend became ill/injured
51 Member became disabled
53 Relative sent to nursing home
56 Parent/spouse died
57 Child died
58 Relative died
59 Close friend died
60 Married child divorced/separated
61 Member ends close relationship
62 Family member married
63 Young adult member leaves home
64 Young adult member begins college
65 New person in (back in) house
66 Parent/spouse returns to school
67 Family member went to jail or juvenile detention
70 Family member ran away from home
71 Member dropped out of school

Affected Family System

Respondent

5 Increase in spousal conflict
8 Increase in difficulties managing teenagers
9 Increase in difficulties managing school kids
10 Increase in difficulties managing preschoolers
11 Increase in difficulties managing toddlers
12 Increase in difficulties managing infants
14 Increase in disagreement about activities
15 Increase in unresolved issues
16 Increase in unfinished chores
17 Increase in in-law conflict
18 Spouse/parent separated, divorced
19 Spouse/parent has "affair"
20 Increase in difficulties with ex-spouse
21 Increase in difficulties in sex relationship
26 Took loan to cover increased expenses
27 Went on welfare
31 Purchased or built a home
37 Delay in receiving alimony payments
43 Decrease in job satisfaction
52 Increase in difficulties managing ill member
54 Increase care to parents
55 Difficulty arranging child care
69 Sexual abuse or violence in the home

Family

3 Family member has emotional problems
4 Family member has drug/alcohol problems
14 Increase in disagreement about activities
15 Increase in unresolved issues
16 Increase in unfinished chores
23 Unmarried family member pregnant

24 Family member had abortion
25 Family member gave birth or adopted
28 Change in conditions hurt family business
29 Change in conditions hurt family investments
30 New business started
32 Purchased car or other major item
33 Increase in credit card debts
34 Increase in medical/dental costs
35 Increase in necessity costs
36 Increase in child education costs
38 Family member changed jobs
39 Family member quit or lost job
40 Family member retired
41 Member started or returned to work
42 Member had extended work absence
44 Member had difficulties with work colleagues
45 Family member promoted
46 Moved to new home or apartment
51 Member became disabled
52 Increase in difficulties managing ill member
53 Relative sent to nursing home
61 Member ends close relationship
62 Family member married
65 New person in (back in) house
67 Family member went to jail or juvenile detention
68 Family member arrested
69 Sexual abuse or violence in the home
70 Family member ran away from home
71 Member dropped out of school

Children

6 Increase in parent/child conflict
7 Increase in sibling conflict
8 Increase in difficulties managing teenagers
9 Increase in difficulties managing school kids
10 Increase in difficulties managing preschoolers
11 Increase in difficulties managing toddlers
12 Increase in difficulties managing infants
13 Increase in outside child activities
36 Increase in child education costs
37 Delay in receiving alimony payments
47 New school for child
49 Child became ill/injured
55 Difficulty arranging child care
57 Child died
60 Married child divorced/separated
63 Young adult member leaves home
64 Young adult member begins college

Spouse

1 Increase in father's time away
2 Increase in mother's time away

5 Increase in spousal conflict
18 Spouse/parent separated, divorced
19 Spouse/parent has "affair"
20 Increase in difficulties with ex-spouse
21 Increase in difficulties in sex relationship
22 Unwanted or difficult pregnancy
37 Delay in receiving alimony payments
48 Parent/spouse became ill/injured
56 Parent/spouse died
66 Parent/spouse returns to school

Parents

1 Increase in father's time away
2 Increase in mother's time away
6 Increase in parent/child conflict
18 Spouse/parent separated, divorced
19 Spouse/parent has "affair"
48 Parent/spouse became ill/injured
54 Increase care to parents
56 Parent/spouse died
58 Relative died
66 Parent/spouse returns to school

Friends

14 Increase in disagreement about activities
50 Relative/friend became ill/injured
59 Close friend died
61 Member ends close relationship

In-laws

17 Increase in in-law conflict

Relatives

17 Increase in in-law conflict
50 Relative/friend became ill/injured
53 Relative sent to nursing home
58 Relative died

Co-workers

44 Member had difficulties with work colleagues

Content of Event or Change

Conflict

5 Increase in spousal conflict
6 Increase in parent/child conflict
7 Increase in sibling conflict
8 Increase in difficulties managing teenagers
9 Increase in difficulties managing school kids
10 Increase in difficulties managing preschoolers
11 Increase in difficulties managing toddlers
12 Increase in difficulties managing infants

14 Increase in disagreement about activities
15 Increase in unresolved issues
16 Increase in unfinished chores
17 Increase in in-law conflict
20 Increase in difficulties with ex-spouse
21 Increase in difficulties in sex relationship
52 Increase in difficulties managing ill member
69 Sexual abuse or violence in the home
70 Family member ran away from home

Separation

1 Increase in father's time away
2 Increase in mother's time away
13 Increase in outside child activities
18 Spouse/parent separated, divorced
37 Delay in receiving alimony payments
60 Married child divorced/separated
61 Member ends close relationship

Illness

4 Family member has drug/alcohol problems
48 Parent/spouse became ill/injured
49 Child became ill/injured
50 Relative/friend became ill/injured
51 Member became disabled
52 Increase in difficulties managing ill member
53 Relative sent to nursing home

Sexual Conflict

19 Spouse/parent has "affair"
21 Increase in difficulties in sex relationship
69 Sexual abuse or violence in the home

Pregnancy

22 Unwanted or difficult pregnancy
23 Unmarried family member pregnant
24 Family member had abortion

Debt

26 Took loan to cover increased expenses
27 Went on welfare
28 Change in conditions hurt family business
29 Change in conditions hurt family investments
30 New business started
33 Increase in credit card debts
34 Increase in medical/dental costs
35 Increase in necessity costs
36 Increase in child education costs
37 Delay in receiving alimony payments
39 Family member quit or lost job
42 Member had extended work absence
54 Increase care to parents

Work Related

38 Family member changed jobs
39 Family member quit or lost job
40 Family member retired
41 Member started or returned to work
42 Member had extended work absence
43 Decrease in job satisfaction
44 Member had difficulties with work colleagues

Finance

26 Took loan to cover increased expenses
27 Went on welfare
28 Change in conditions hurt family business
29 Change in conditions hurt family investments
30 New business started
31 Purchased or built a home
32 Purchased car or other major item
33 Increase in credit card debts
34 Increase in medical/dental costs
35 Increase in necessity costs
36 Increase in child education costs
37 Delay in receiving alimony payments
38 Family member changed jobs
39 Family member quit or lost job
40 Family member retired
41 Member started or returned to work
42 Member had extended work absence
43 Decrease in job satisfaction
44 Member had difficulties with work colleagues
45 Family member promoted
46 Moved to new home or apartment
54 Increase care to parents

Death

56 Parent/spouse died
57 Child died
58 Relative died
59 Close friend died

Legal Troubles

67 Family member went to jail or juvenile detention
68 Family member arrested

Appendix B

LISREL Analyses of the Final Model of Each Measure of Family Functioning

FINAL MODEL FOR THE FSS

LISREL ESTIMATES (MAXIMUM LIKELIHOOD)

LAMBDA X

	KSI 1	KSI 2	KSI 3	KSI 4
FSS1	.548	.000	.000	.000
FSS2	.000	.762	.000	.000
FSS3	.879	.000	.000	.000
FSS4	.000	.816	.000	.000
FSS5	.000	.463	.000	.000
FSS6	.000	.000	.617	.000
FSS7	.000	.347	.434	.000
FSS9	.000	.000	.643	.000
FSS10	.000	.000	.459	.000
FSS11	.000	.000	.552	.000
FSS12	.000	.000	.522	.000
FSS13	.000	.000	.549	.000
FSS14	.000	.000	.000	.558
FSS15	.000	.000	.000	.648
FSS17	.000	.000	.000	.476
FSS18	.000	.000	.000	.458

PHI

	KSI 1	KSI 2	KSI 3	KSI 4
KSI 1	1.000			
KSI 2	.449	1.000		
KSI 3	.467	.416	1.000	
KSI 4	.322	.285	.594	1.000

THETA DELTA

FSS1	FSS2	FSS3	FSS4	FSS5	FSS6
.700	.419	.228	.334	.786	.620

THETA DELTA

FSS7	FSS9	FSS10	FSS11	FSS12	FSS13
.565	.586	.790	.696	.727	.698

THETA DELTA

FSS14	FSS15	FSS17	FSS18
.689	.580	.773	.791

SQUARED MULTIPLE CORRELATIONS FOR X - VARIABLES

FSS1	FSS2	FSS3	FSS4	FSS5	FSS6
.300	.581	.772	.666	.214	.380

SQUARED MULTIPLE CORRELATIONS FOR X - VARIABLES

FSS7	FSS9	FSS10	FSS11	FSS12	FSS13
.435	.414	.210	.304	.273	.302

SQUARED MULTIPLE CORRELATIONS FOR X - VARIABLES

FSS14	FSS15	FSS17	FSS18
.311	.420	.227	.209

TOTAL COEFFICIENT OF DETERMINATION FOR X - VARIABLES IS .994

CHI-SQUARE WITH 97 DEGREES OF FREEDOM = 689.65 (P = .000)

GOODNESS OF FIT INDEX = .910
ADJUSTED GOODNESS OF FIT INDEX = .874
ROOT MEAN SQUARE RESIDUAL = .060

FINAL MODEL FOR THE FRS

LISREL ESTIMATES (MAXIMUM LIKELIHOOD)

LAMBDA X

	KSI 1	KSI 2	KSI 3
FRS1	.483	.000	.000
FRS2	.526	.000	.000
FRS4	.505	.000	.317
FRS5	.656	.000	.000
FRS6	.582	.000	.000
FRS8	.000	.000	.525
FRS9	.000	.000	.550
FRS10	.000	.000	.365
FRS11	.355	.000	.276
FRS12	.000	.652	.000
FRS13	.691	.000	.000
FRS14	.000	.745	.000
FRS15	.000	.614	.000
FRS16	.000	.501	.000
FRS17	.000	.783	.000
FRS18	.386	.000	.000
FRS19	.000	.498	.000
FRS20	.000	.000	.373
FRS21	.000	.000	.718
FRS22	.000	.000	.616
FRS23	.000	.664	.000
FRS24	.000	.825	.000
FRS25	.000	.731	.000
FRS26	.323	.000	.408
FRS27	.000	.000	.861
FRS28	.000	.000	.885
FRS29	.000	.000	.737
FRS30	.000	.000	.654

PHI

	KSI 1	KSI 2	KSI 3
KSI 1	1.000		
KSI 2	.440	1.000	
KSI 3	.622	.677	1.000

THETA DELTA

FRS1	FRS2	FRS4	FRS5	FRS6	FRS8
.767	.723	.446	.569	.661	.724

THETA DELTA

FRS9	FRS10	FRS11	FRS12	FRS13	FRS14
.698	.866	.676	.575	.523	.445

THETA DELTA

FRS15	FRS16	FRS17	FRS18	FRS19	FRS20
.624	.749	.386	.851	.752	.861

THETA DELTA

FRS21	FRS22	FRS23	FRS24	FRS25	FRS26
.484	.620	.559	.320	.465	.566

THETA DELTA

FRS27	FRS28	FRS29	FRS30
.259	.216	.458	.572

SQUARED MULTIPLE CORRELATIONS FOR X - VARIABLES

FRS1	FRS2	FRS4	FRS5	FRS6	FRS8
.233	.277	.554	.431	.339	.276

SQUARED MULTIPLE CORRELATIONS FOR X - VARIABLES

FRS9	FRS10	FRS11	FRS12	FRS13	FRS14
.302	.134	.324	.425	.477	.555

SQUARED MULTIPLE CORRELATIONS FOR X - VARIABLES

FRS15	FRS16	FRS17	FRS18	FRS19	FRS20
.376	.251	.614	.149	.248	.139

SQUARED MULTIPLE CORRELATIONS FOR X - VARIABLES

FRS21	FRS22	FRS23	FRS24	FRS25	FRS26
.516	.380	.441	.680	.535	.434

SQUARED MULTIPLE CORRELATIONS FOR X - VARIABLES

FRS27	FRS28	FRS29	FRS30
.741	.784	.542	.428

TOTAL COEFFICIENT OF DETERMINATION FOR X - VARIABLES IS .996

CHI-SQUARE WITH 344 DEGREES OF FREEDOM = 2178.52 (P = .000)

GOODNESS OF FIT INDEX = .845
ADJUSTED GOODNESS OF FIT INDEX = .817
ROOT MEAN SQUARE RESIDUAL = .063

FINAL MODEL FOR THE PSI CHILD SCALE

LISREL ESTIMATES (MAXIMUM LIKELIHOOD)

LAMBDA X

	KSI 1	KSI 2	KSI 3
PSI1	.000	.135	.000
PSI2	.000	.336	.000
PSI4	.581	.000	.000
PSI7	.000	.238	.000
PSI11	.000	.000	.339
PSI12	.000	.000	-.379
PSI13	.000	.000	-.704
PSI15	.000	.000	.355
PSI16	.000	-.547	.000
PSI17	.000	.638	.000
PSI18	.000	.000	-.680
PSI19	.000	.000	-.348
PSI20	.000	.705	.000
PSI22	.527	.000	.000
PSI23	.545	.000	.000
PSI24	.000	.000	-.756
PSI25	.000	.577	.000
PSI26	.609	.000	.000
PSI27	.000	.000	-.425
PSI31	.586	.000	.000
PSI32	.000	.388	.000
PSI33	.345	.000	.000
PSI34	.000	.661	.000
PSI36	.529	.000	.000
PSI37	.378	.000	.000
PSI38	.536	.000	.000
PSI40	.000	-.518	.000
PSI41	.440	.000	.000
PSI42	.000	-.450	.000
PSI43	.000	-.425	.000
PSI44	.000	.566	.000
PSI45	.329	.000	.000
PSI47	.649	.000	.000
PSI48	.700	.000	.000
PSI49	.000	.341	.000
PSI50	.627	.000	.000

PHI

	KSI 1	KSI 2	KSI 3
KSI 1	1.000		
KSI 2	.688	1.000	
KSI 3	-.532	-.447	1.000

THETA DELTA

PSI1	PSI2	PSI4	PSI7	PSI11	PSI12
.982	.887	.663	.944	.885	.856

THETA DELTA

PSI13	PSI15	PSI16	PSI17	PSI18	PSI19
.505	.874	.701	.593	.538	.879

THETA DELTA

PSI20	PSI22	PSI23	PSI24	PSI25	PSI26
.503	.722	.703	.429	.667	.629

THETA DELTA

PSI27	PSI31	PSI32	PSI33	PSI34	PSI36
.819	.657	.849	.881	.562	.720

THETA DELTA

PSI37	PSI38	PSI40	PSI41	PSI42	PSI43
.857	.712	.732	.807	.797	.819

THETA DELTA

PSI44	PSI45	PSI47	PSI48	PSI49	PSI50
.679	.892	.579	.511	.884	.607

SQUARED MULTIPLE CORRELATIONS FOR X - VARIABLES

PSI1	PSI2	PSI4	PSI7	PSI11	PSI12
.018	.113	.337	.056	.115	.144

SQUARED MULTIPLE CORRELATIONS FOR X - VARIABLES

PSI13	PSI15	PSI16	PSI17	PSI18	PSI19
.495	.126	.299	.407	.462	.121

SQUARED MULTIPLE CORRELATIONS FOR X - VARIABLES

PSI20	PSI22	PSI23	PSI24	PSI25	PSI26
.497	.278	.297	.571	.333	.371

SQUARED MULTIPLE CORRELATIONS FOR X - VARIABLES

PSI27	PSI31	PSI32	PSI33	PSI34	PSI36
.181	.343	.151	.119	.438	.280

SQUARED MULTIPLE CORRELATIONS FOR X - VARIABLES

PSI37	PSI38	PSI40	PSI41	PSI42	PSI43
.143	.288	.268	.193	.203	.181

SQUARED MULTIPLE CORRELATIONS FOR X - VARIABLES

PSI44	PSI45	PSI47	PSI48	PSI49	PSI50
.321	.108	.421	.489	.116	.393

TOTAL COEFFICIENT OF DETERMINATION FOR X - VARIABLES IS .991

CHI-SQUARE WITH 591 DEGREES OF FREEDOM = 3258.89 (P = .000)

GOODNESS OF FIT INDEX = .815
ADJUSTED GOODNESS OF FIT INDEX = .791
ROOT MEAN SQUARE RESIDUAL = .073

FINAL MODEL FOR THE PSI PARENT SCALE

LISREL ESTIMATES (MAXIMUM LIKELIHOOD)

LAMBDA X

	KSI 1	KSI 2	KSI 3	KSI 4	KSI 5	KSI 6
PSI29	.500	.000	.000	.000	.000	.000
PSI68	.369	.000	.000	.000	.000	.000
PSI69	.615	.000	.000	.000	.000	.000
PSI70	.665	.000	.000	.000	.000	.000
PSI71	.671	.000	.000	.000	.000	.000
PSI72	.683	.000	.000	.000	.000	.000
PSI73	.700	.000	.000	.000	.000	.000
PSI74	.550	.000	.000	.000	.000	.000
PSI96	.622	.000	.000	.000	.000	.000
PSI62	.000	.524	.000	.000	.000	.000
PSI63	.000	.579	.000	.000	.000	.000
PSI64	.000	.511	.000	.000	.000	.000
PSI65	.000	.409	.000	.000	.000	.000
PSI67	.000	.467	.000	.000	.000	.000
PSI79	.000	.642	.000	.000	.000	.000
PSI59	.000	.000	.691	.000	.000	.000
PSI60	.000	.000	.834	.000	.000	.000
PSI30	.000	.000	.000	.511	.000	.000
PSI53	.000	.000	.000	.535	.000	.000
PSI54	.000	.000	.000	.484	.000	.000
PSI57	.000	.000	.000	.574	.000	.000
PSI58	.000	.000	.000	.544	.000	.000
PSI61	.000	.000	.000	.382	.000	.000
PSI84	.000	.000	.000	.000	.642	.000
PSI85	.000	.000	.000	.000	.730	.000
PSI86	.000	.000	.000	.000	.716	.000
PSI87	.000	.000	.000	.000	.800	.000
PSI88	.000	.000	.000	.000	.430	.000
PSI89	.000	.000	.000	.000	.000	.421
PSI91	.000	.000	.000	.000	.000	.666
PSI92	.000	.000	.000	.000	.000	.699
PSI93	.000	.000	.000	.000	.000	.695
PSI94	.000	.000	.000	.000	.000	.681
PSI95	.000	.000	.000	.000	.000	-.379
PSI100	.000	.000	.000	.000	.000	.652
PSI75	.000	.000	.000	.000	.000	.000
PSI77	.000	.000	.000	.000	.000	.000
PSI78	.000	.000	.000	.000	.000	.000
PSI82	.000	.000	.000	.000	.000	.000
PSI97	.000	.000	.000	.000	.000	.000
PSI98	.000	.000	.000	.000	.000	.000
PSI101	.000	.000	.000	.000	.000	.000
PSI28	.000	.000	.000	.000	.000	.000
PSI55	.000	.000	.000	.000	.000	.000
PSI81	.000	.000	.000	.000	.000	.000
PSI83	.000	.000	.000	.000	.000	.000

LAMBDA X

	KSI 7	KSI 8	KSI 9
PSI29	.000	.000	.000
PSI68	.000	.000	.000
PSI69	.000	.000	.000
PSI70	.000	.000	.000
PSI71	.000	.000	.000
PSI72	.000	.000	.000
PSI73	.000	.000	.000
PSI74	.000	.000	.000
PSI96	.000	.000	.000
PSI62	.000	.000	.000
PSI63	.000	.000	.000
PSI64	.000	.000	.000
PSI65	.000	.000	.000
PSI67	.000	.000	.000
PSI79	.000	.000	.000
PSI59	.000	.000	.000
PSI60	.000	.000	.000
PSI30	.000	.000	.000
PSI53	.000	.000	.000
PSI54	.000	.000	.000
PSI57	.000	.000	.000
PSI58	.000	.000	.000
PSI61	.000	.000	.000
PSI84	.000	.000	.000
PSI85	.000	.000	.000
PSI86	.000	.000	.000
PSI87	.000	.000	.000
PSI88	.000	.000	.000
PSI89	.000	.000	.000
PSI91	.000	.000	.000
PSI92	.000	.000	.000
PSI93	.000	.000	.000
PSI94	.000	.000	.000
PSI95	.000	.000	.000
PSI100	.000	.000	.000
PSI75	.773	.000	.000
PSI77	.672	.000	.000
PSI78	.603	.000	.000
PSI82	.537	.000	.000
PSI97	.000	.759	.000
PSI98	.000	-.588	.000
PSI101	.000	.675	.000
PSI28	.000	.000	.634
PSI55	.000	.000	.410
PSI81	.000	.000	.574
PSI83	.000	.000	.627

PHI

	KSI 1	KSI 2	KSI 3	KSI 4	KSI 5	KSI 6
KSI 1	1.000					
KSI 2	.502	1.000				
KSI 3	.012	.159	1.000			
KSI 4	-.524	-.550	-.055	1.000		
KSI 5	.614	.365	.067	-.372	1.000	
KSI 6	.638	.567	.188	-.526	.576	1.000
KSI 7	.547	.666	.089	-.595	.439	.597
KSI 8	.501	.282	.025	-.380	.434	.558
KSI 9	.607	.477	-.110	-.463	.493	.533

PHI

	KSI 7	KSI 8	KSI 9
KSI 7	1.000		
KSI 8	.362	1.000	
KSI 9	.480	.444	1.000

THETA DELTA

PSI29	PSI68	PSI69	PSI70	PSI71	PSI72
.750	.864	.622	.558	.549	.533

THETA DELTA

PSI73	PSI74	PSI96	PSI62	PSI63	PSI64
.510	.697	.613	.726	.665	.739

THETA DELTA

PSI65	PSI67	PSI79	PSI59	PSI60	PSI30
.833	.782	.588	.522	.304	.739

THETA DELTA

PSI53	PSI54	PSI57	PSI58	PSI61	PSI84
.714	.766	.671	.704	.854	.588

THETA DELTA

PSI85	PSI86	PSI87	PSI88	PSI89	PSI91
.467	.488	.360	.815	.822	.557

THETA DELTA

PSI92	PSI93	PSI94	PSI95	PSI100	PSI75
.512	.518	.536	.857	.575	.568

THETA DELTA

PSI77	PSI78	PSI82	PSI97	PSI98	PSI101
.453	.505	.720	.510	.592	.530

THETA DELTA

PSI28	PSI55	PSI81	PSI83
.757	.804	.612	.502

SQUARED MULTIPLE CORRELATIONS FOR X - VARIABLES

PSI29	PSI68	PSI69	PSI70	PSI71	PSI72
.250	.136	.378	.442	.451	.467

SQUARED MULTIPLE CORRELATIONS FOR X - VARIABLES

PSI73	PSI74	PSI96	PSI62	PSI63	PSI64
.490	.303	.387	.274	.335	.261

SQUARED MULTIPLE CORRELATIONS FOR X - VARIABLES

PSI65	PSI67	PSI79	PSI59	PSI60	PSI30
.167	.218	.412	.478	.696	.261

SQUARED MULTIPLE CORRELATIONS FOR X - VARIABLES

PSI53	PSI54	PSI57	PSI58	PSI61	PSI84
.286	.234	.329	.296	.146	.412

SQUARED MULTIPLE CORRELATIONS FOR X - VARIABLES

PSI85	PSI86	PSI87	PSI88	PSI89	PSI91
.533	.512	.640	.185	.178	.443

SQUARED MULTIPLE CORRELATIONS FOR X - VARIABLES

PSI92	PSI93	PSI94	PSI95	PSI100	PSI75
.488	.482	.464	.143	.425	.432

SQUARED MULTIPLE CORRELATIONS FOR X - VARIABLES

PSI77	PSI78	PSI82	PSI97	PSI98	PSI101
.547	.495	.280	.490	.408	.470

SQUARED MULTIPLE CORRELATIONS FOR X - VARIABLES

PSI28	PSI55	PSI81	PSI83
.243	.196	.388	.498

TOTAL COEFFICIENT OF DETERMINATION FOR X - VARIABLES IS 1.000

CHI-SQUARE WITH 953 DEGREES OF FREEDOM = 2840.36 (P = .000)

GOODNESS OF FIT INDEX = .876
ADJUSTED GOODNESS OF FIT INDEX = .859
ROOT MEAN SQUARE RESIDUAL = .053

FINAL MODEL FOR THE FACES

LISREL ESTIMATES (MAXIMUM LIKELIHOOD)

LAMBDA X

	KSI 1	KSI 2	KSI 3	KSI 4	KSI 5
FACES1	.485	.000	.000	.000	.000
FACES2	.000	.000	.484	.000	.000
FACES3	.470	.000	.000	.000	.000
FACES4	.000	.000	.724	.000	.000
FACES5	.470	.000	.000	.000	.000
FACES6	.000	.000	.000	.000	.665
FACES7	.470	.000	.000	.000	.000
FACES8	.000	.000	.000	.497	.000
FACES9	.705	.000	.000	.000	.000
FACES10	.000	.000	.586	.000	.000
FACES11	.691	.000	.000	.000	.000
FACES12	.000	.000	.549	.000	.000
FACES13	.571	.000	.000	.000	.000
FACES14	.000	.000	.000	.466	.000
FACES15	.664	.000	.000	.000	.000
FACES16	.000	.000	.000	.373	.000
FACES17	.527	.000	.000	.000	.000
FACES18	.000	.000	.000	.000	.348
FACES19	.624	.000	.000	.000	.000
FACES20	.000	.000	.000	.000	.235
FACES21	.000	.474	.000	.000	.000
FACES22	.000	.000	.609	.000	.000
FACES23	.000	.544	.000	.000	.000
FACES24	.000	.000	.744	.000	.000
FACES25	.000	.402	.000	.000	.000
FACES26	.000	.000	.000	.000	.779
FACES27	.000	.578	.000	.000	.000
FACES28	.000	.000	.000	.544	.000
FACES29	.000	.620	.000	.000	.000
FACES30	.000	.000	.634	.000	.000
FACES31	.000	.750	.000	.000	.000
FACES32	.000	.000	.569	.000	.000
FACES33	.000	.658	.000	.000	.000
FACES34	.000	.000	.000	.519	.000
FACES35	.000	.721	.000	.000	.000
FACES36	.000	.000	.000	.530	.000
FACES37	.000	.584	.000	.000	.000
FACES38	.000	.000	.000	.000	-.108
FACES39	.000	.633	.000	.000	.000
FACES40	.000	.000	.000	.000	-.038

PHI

	KSI 1	KSI 2	KSI 3	KSI 4	KSI 5
KSI 1	1.000				
KSI 2	.629	1.000			
KSI 3	.000	.000	1.000		
KSI 4	.000	.000	.498	1.000	
KSI 5	.000	.000	.363	.584	1.000

THETA DELTA

FACES1	FACES2	FACES3	FACES4	FACES5	FACES6
.764	.766	.779	.475	.779	.558

THETA DELTA

FACES7	FACES8	FACES9	FACES10	FACES11	FACES12
.779	.753	.503	.657	.523	.698

THETA DELTA

FACES13	FACES14	FACES15	FACES16	FACES17	FACES18
.673	.783	.559	.861	.722	.879

THETA DELTA

FACES19	FACES20	FACES21	FACES22	FACES23	FACES24
.610	.945	.775	.629	.704	.446

THETA DELTA

FACES25	FACES26	FACES27	FACES28	FACES29	FACES30
.838	.392	.666	.704	.615	.598

THETA DELTA

FACES31	FACES32	FACES33	FACES34	FACES35	FACES36
.438	.676	.567	.731	.480	.719

THETA DELTA

FACES37	FACES38	FACES39	FACES40
.659	.988	.599	.999

SQUARED MULTIPLE CORRELATIONS FOR X - VARIABLES

FACES1	FACES2	FACES3	FACES4	FACES5	FACES6
.236	.234	.221	.525	.221	.442

SQUARED MULTIPLE CORRELATIONS FOR X - VARIABLES

FACES7	FACES8	FACES9	FACES10	FACES11	FACES12
.221	.247	.497	.343	.477	.302

SQUARED MULTIPLE CORRELATIONS FOR X - VARIABLES

FACES13	FACES14	FACES15	FACES16	FACES17	FACES18
.327	.217	.441	.139	.278	.121

SQUARED MULTIPLE CORRELATIONS FOR X - VARIABLES

FACES19	FACES20	FACES21	FACES22	FACES23	FACES24
.390	.055	.225	.371	.296	.554

SQUARED MULTIPLE CORRELATIONS FOR X - VARIABLES

FACES25	FACES26	FACES27	FACES28	FACES29	FACES30
.162	.608	.334	.296	.385	.402

SQUARED MULTIPLE CORRELATIONS FOR X - VARIABLES

FACES31	FACES32	FACES33	FACES34	FACES35	FACES36
.562	.324	.433	.269	.520	.281

SQUARED MULTIPLE CORRELATIONS FOR X - VARIABLES

FACES37	FACES38	FACES39	FACES40
.341	.012	.401	.001

TOTAL COEFFICIENT OF DETERMINATION FOR X - VARIABLES IS .999

CHI-SQUARE WITH 736 DEGREES OF FREEDOM = 4416.71 (P = .000)

GOODNESS OF FIT INDEX = .789
ADJUSTED GOODNESS OF FIT INDEX = .765
ROOT MEAN SQUARE RESIDUAL = .092

VITA Triplespace

MATTHEW JAMES TAYLOR

ADDRESSES

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EDUCATION

Ph.D. in Psychology with an emphasis on Research and Evaluation Methodologies (Utah State University, 1995)

M. S. History (Utah State University, 1994)

B.S. Mathematics (Utah State University, 1983)

WORK EXPERIENCE

October 1990 to present. **Site Coordinator** and **Project Manager, Research Associate** (Early Intervention Research Institute), and **Instructor** (Department of Psychology, Utah State University). Duties include:

- Coordinating the assessment of subjects in the SMA Intensity Study and the Head Start Success Study.
- Updating design and assessment of SMA and Head Start projects.
- Overseeing data management from protocol to computer.
- Data analysis and writing final research reports.
- Training clerks and graduate students.

December 1985 to September 1990. Research Assistant at the Early Intervention Research Institute. Duties included:

- Overseeing data collection and procedures for the Early Intervention Research Institute's integrative review of early intervention efficacy research.
- Data analysis.
- Program design clarification, updating, and documentation of dissemination materials.
- Dissemination of data, publication, and materials relating to the Early Intervention Research integrative review.
- Computer consultant.
- Training of clerks and graduate assistants.

WORK EXPERIENCE (continued)

December 1985 to present. Consulting for research projects in the Departments of Psychology, Secondary Education and Engineering. Projects include:

- Evaluation of the Utah State University Psychology doctoral core curriculum.
- Evaluation of the Utah State University Psychology Research and Evaluation Methodologies core curriculum.
- Research Assistant for the evaluation of man's role in extended man space flight (Funded by McDonnell-Douglas).
- Dissertations within the School of Education.

March 1983 to June 1985. Research Assistant for the Department of History. Duties included doing research and writing on the Centennial Report of Utah State University.

TEACHING EXPERIENCE

October 1990 to Present. Instructor in the Department of Psychology. Taught graduate course in research design and analysis (Psych 667), and doctoral course in advanced psychometrics (Psych 781). Student evaluation ratings averaged 7.7 (Scale 1-10 with 7 and above comparable to best profs)

March 1990 to June 1990. Instructor in the Department of Math and Statistics. Taught course in college algebra (Math 101). Student evaluation ratings averaged 8.2.

January 1990 to June 1990. Instructor in the Department of Special Education. Designed and taught a seminar in research analysis using micro computers.

November 1985 to March 1986. Assistant Basketball Coach for Utah State University. Head Basketball Coach of Utah State University Junior Varsity.

October 1985 to March 1986. Instructor in the Department of Health, Physical Education, and Recreation. Taught classes in racquetball. Student evaluation ratings all exceeding 9.

REFEREED JOURNAL ARTICLES

Onufrak, B., Saylor, C. F., **Taylor, M. J.**, Eyberg, S. M., & Boyce, G. C. (in press). Determinants of responsiveness in mothers of children with intraventricular hemorrhage. Journal of Pediatric Psychology.

REFEREED JOURNAL ARTICLES (continued)

Mauk, G. W., **Taylor, M. J.**, White, K. R., & Allen, T. S. (1994). Comments on Stack and Gunclach's 'The Effect of Country Music on Suicide': An 'Achy Breaky Heart' may not kill you. Social Forces, 72(4), 1249-1255.

White, K. R., Boyce, G. C., Casto, G., Innocenti, M. S., **Taylor, M. J.**, Goetze, L. D., & Behl, D. (1994). Comparative evaluations of early intervention alternatives: Response to Guralnick and Telzrow. Early Education and Development, 5(1), 56-68.

Crowley, S. L., & **Taylor, M. J.** (1994). Mothers' and fathers' perceptions of family functioning in families having children with disabilities. Early Education and Development. 5, 216-228.

Taylor, M. J., White, K. R., & Kusmierek, A. (1993). The cost-effectiveness of increasing hours per week of early intervention services for young children with disabilities. Early Education and Development, 4(4), 238-255.

Taylor, M. J., & Innocenti, M. S. (1994). Why Covariance? A rationale for using analysis of covariance procedures in randomized studies. Journal of Early Intervention, 17, 455-466.

Taylor, M. J., White, K. R. (1993). An evaluation of alternative methods for computing standardized mean difference effect sizes. Journal of Experimental Education, 61(1), 63-72.

Taylor, M. J., & White, K. R. (1992). A meta-Analysis of hooking mortality in non-anadromous trout. North American Journal of Fisheries Management, 12(4), 760-767.

Mauk, G. W., & **Taylor, M. J.** (1993). Counseling services in middle-level schools: Issues of recognition, reclaiming, redefinition, and rededication. Middle School Journal, 24(5), 3-9.

White, K. R., **Taylor, M. J.**, & Moss, V. D. (1989, April). Does research support claims about the benefits of involving parents in early intervention programs. Review of Educational Research, 62(1), 91-125.

EXTRAMURAL FUNDING RECEIVED (limited to those funded)

Innocenti, M. S., & **Taylor, M. J.** (1992). Correlates of positive Head Start outcomes. Funded by the Department of Health and Human Services. $500,000 (60 months).

Crowley, S. L., & **Taylor, M. J.** (1993). Family functioning in families of children with disabilities: An intensive psychometric investigation of five family measures. Funded by the Office of Special Education Programs. $67,888 (12 months).

PRESENTATIONS AT PROFESSIONAL MEETINGS

Crowley, S. L., **Taylor, M. J.**, & Sharpnack, J. D. (1994, August). Use of the FACES III with families having children with disabilities. Paper presented at the American Psychological Association National Conference, Los Angeles, CA.

Sharpnack, J. D., **Taylor, M. J.**, & Crowley, S. L. (1994, April). The relationship between maternal marital status and family functioning of families having a child with disabilities. Paper presented at the Rocky Mountain Psychological Association Regional Conference, Las Vegas, NV.

Innocenti, M. S., **Taylor, M. J.**, & England, T. (1993, November). The Utah correlates of positive Head Start outcomes study. Paper presented at the National Head Start Research Conference, Washington DC.

Taylor, M. J., Mauk, G. W., & Allen, T. S. (1993, August). A generalizability study of the Battelle Developmental Inventory. Paper presented at the American Psychological Association National Conference, Toronto, Canada.

Crowley, S. L., & **Taylor, M. J.** (1993, August). The Parenting Stress Index: Psychometric characteristics with families with children with disabilities. Paper presented at the American Psychological Association National Conference, Toronto, Canada.

Taylor, M. J., Crowley, S. L., & White, K. R. (1993, April). Measuring family support and resources: Psychometric investigation of the FSS and FRS. Paper presented at the American Educational Research Association National Conference, Atlanta, Georgia.

Taylor, M. J., & Crowley, S. L. (1993, April). Comprehensive Evaluation of Family Functioning: A psychometric assessment. Paper presented at the American Educational Research Association National Conference, Atlanta, Georgia.

Crowley, S. L., & **Taylor, M. J.** (1993, April). Parental perception and intervention with families. Paper presented at the American Educational Research Association National Conference, Atlanta, Georgia.

Taylor, M. J., & Innocenti, M. S. (1991, June). Why covariance? Paper presented at the Pacific Division of the American Association for the Advancement of Science, Logan, Utah. Winner of Honorable Mention.

PRESENTATIONS AT PROFESSIONAL MEETINGS (continued)

Taylor, M. J., & Rodgers, P. L. (1991, April). Meta-analysis coding design and analysis: three designs for educational research. Paper presented at the American Educational Research Association National Conference, Chicago, Illinois.

Mauk, G. W., Mortensen, L. B., & **Taylor, M. J.** (1991, April). A survey of school counselors of early adolescents in Utah. Paper presented at the 71st Annual Convention of the Western Psychological Association, San Francisco, California.

Taylor, M. J., Mortensen, L. B., & Burnham, B. (1990, November). Telelecturing: The next step in long distance education. Paper presented at The American Association for Adult and Continuing Education, Salt Lake City, Utah.

Taylor, M. J., & White, K. R. (1990, April). Stability and bias in Glass' standard mean difference effect size: A Monte Carlo study. Paper presented at the American Educational Research Association National Conference, Boston, Massachusetts.

Taylor, M. J., & White, K. R. (1990, April). An evaluation of alternative methods for computing standardized mean difference effect sizes. Paper presented at the American Educational Research Association National Conference, Boston, Massachusetts.

White, K. R., **Taylor, M. J.**, & Moss, V. D. (1989, April). Does research support claims about the benefits of involving parents in early intervention programs? Paper presented at the American Educational Research Association National Conference, Kansas City, Missouri.

TECHNICAL REPORTS

Innocenti, M. S., & **Taylor, M. J.** (1994). Annual report for the period October 1992 to September 1993: Correlates of positive Head Start outcomes study. Report submitted to the Department of Health and Human Services (Award #90CD0970/01).

Camperell, K., Southworth, J., & **Taylor, M. J.** (1993). Survey of english/reading/language arts instruction for low achieving students in Utah secondary schools. Report submitted to the Utah State Department of Education.

Taylor, M. J., et al. (1993). SMA Lake McHenry project. In K. R. White (Ed.), 1992-1993 Annual report of the longitudinal studies of the effects of alternative types of early intervention for handicapped children (Contract # HS90010001) Early Intervention Research Institute, Logan.

TECHNICAL REPORTS (continued)

Taylor, M. J., et al. (1992). SMA Lake McHenry project. In K. R. White (Ed.), 1991-1992 Annual report of the longitudinal studies of the effects of alternative types of early intervention for handicapped children (pp. 89-131) (Contract # HS90010001) Early Intervention Research Institute, Logan.

Taylor, M. J., et al. (1991). SMA Lake McHenry project. In K. R. White (Ed.), 1990-1991 Annual report of the longitudinal studies of the effects of alternative types of early intervention for handicapped children (pp. 83-124) (Contract # HS90010001) Early Intervention Research Institute, Logan.

Ferguson, T. J., Higham, J., Moss, V., Palmer-Kerbs, C., Parthasarthy, A., Stone, M., **Taylor, M. J.**, & Trenton, J. (1990). The Manned Assembly, Service, and Repair Module (MASR): Scheduling, Social Stability, and Productivity Issues. McDonnell-Douglas SSC-HB.

OTHER PUBLICATIONS

Innocenti, M. S., & **Taylor, M. J.** (1993). Head Start success study. Exceptional News, 16(3), 1, 6-7.

PRODUCTS DEVELOPED

Taylor, M. J. (1989). STATBOOK. A software program designed to compute summary statistics, serve as a complete set of statistical tables, and do two-group power analysis.

HISTORICAL BACKGROUND

Birthdate, November 28, 1958. Last of three children. Born and raised in La Cañada, California. Enjoy reading, flyfishing, composing and performing music, and flying, building and designing RC airplanes. Have performed in a variety of operas, musicals, dinner theatre, and choirs. Also have coached baseball and basketball for the last 15 years at levels from and including elementary school to college.